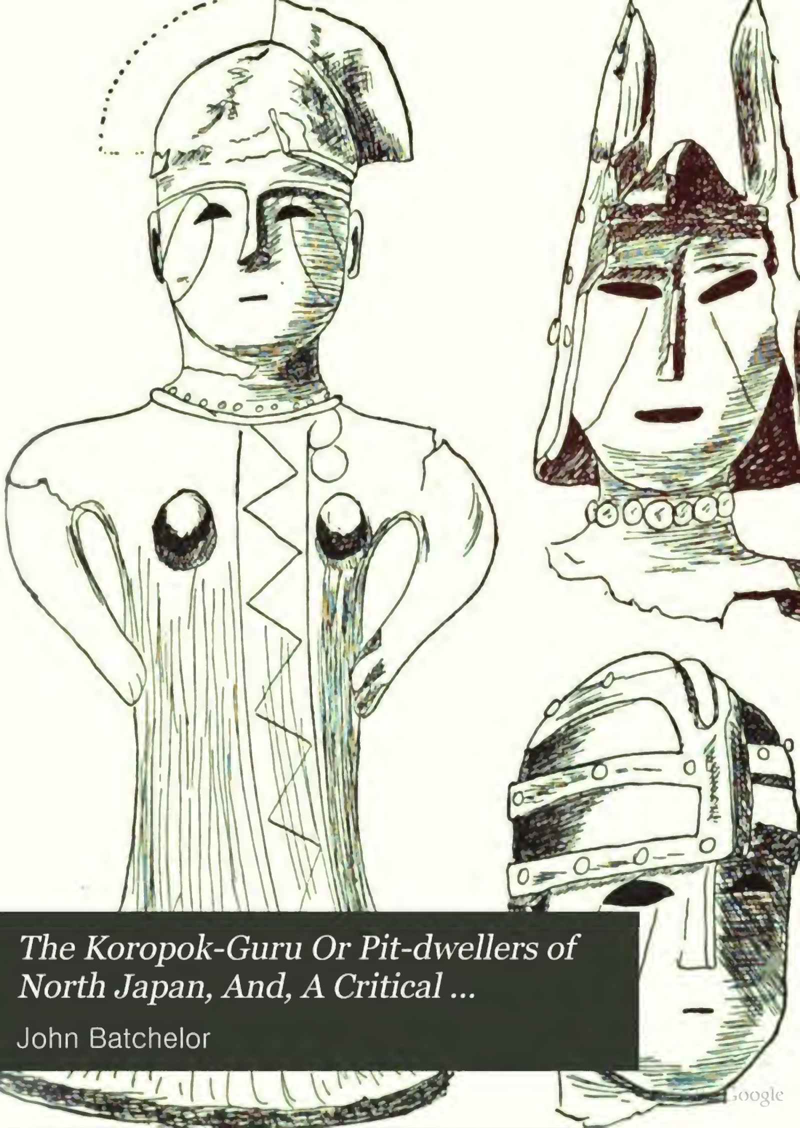

The Koropok-Guru Or Pit-dwellers of North Japan, And, A Critical ...

John Batchelor

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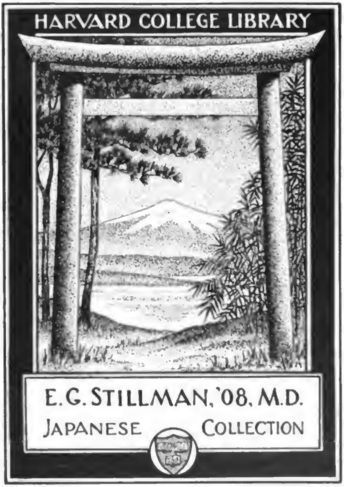

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THE KOROPOK-GURU,

OR

PIT-DWELLERS OF NORTH JAPAN.

AND

A Critical Examination

OF THE

Nomenclature of Yezo,

BY THE

Rev. J. BATCHELOR, F.R.G.S.

Sapporo, June, 1904.

YOKOHAMA:
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1905.

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PART I.

THE KOROPOK-GURU

OR

PIT-DWELLERS OF NORTH JAPAN.

In the "Memoirs of the Literature College, Imperial University of Japan, No. 1," which treats of the "language, mythology, and geographical nomenclature of Japan viewed in the light of Aino studies,"* including also "An Ainu Grammar" by myself, Professor Basil Hall Chamberlain wrote on page 57, at the close of his list of place-names, as follows:—

"The above catalogue may teach several things. First we learn from it the method followed by the Ainos in their geographical nomenclature, which is simple enough. They describe the river, village, or cape, as the case may be, by some striking feature. . . . . . . Secondly, there is a large number of names not to be explained in the *present state* of our knowledge. Some of them have perhaps been corrupted beyond recognition. Some are possibly pure but antiquated Aino, no longer understood in the absence of any literary tradition. *Why should not some have descended from the aborigines who preceded the Ainos, the latter adopting them as the Japanese have adopted Aino names?*"†

Early in March this year (1904) I had the pleasure of escorting Professor Frederick Starr, of the Chicago University, to some of the Ainu villages, and while on the journey I found him to be particularly interested in place names and was on more than one occasion much struck by the many questions he put with regard to them, but when he began to speak of the supposed connection of some of them with the race of men spoken of in the sentence I have italicised above as the "aborigines who preceded the Ainos," I at once saw the drift of his questions. It was after one of our conversations on these matters that he pointed out to me Prof. Chamberlain's words:—words which I had not previously taken into any serious account. The result is the present brochure.

Now, I must remark at the outset that I am one of those who has quite

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* Prof. Chamberlain always wrote *Aino* and *Ainos*, but the real native name is Ainu for both the singular and plural numbers.

† The italics are mine.

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abandoned the idea of a race of men in Yezo anterior to the Ainu. I frankly admit that I formerly acquiesced in the ordinary belief in the existence of such a people in the ages gone by. The assertions of those who were here many years before me; the assurances given me by the Japanese; the so-called tradition of the Ainu respecting them, and the remains of pits in which they are said to have lived, together with the exhibition of certain remnants of old pottery and such like things were too emphatic and certain to be laid quietly aside by a new comer; and then lastly there were certain difficult place names whose meaning could not at that time be ascertained. In fact, like the famous missing link your aborigine could almost be seen and touched. But none of these foundations of orthodox belief will bear the light, and I have therefore, as in duty bound, abandoned them.

But to examine the matter briefly yet as thoroughly as space will allow. And *first* as regards the pits. They are here in Yezo in great numbers, so that one is constantly coming across them. The Ainu call them *Koropok-un-guru koro chisei kot, i.e.* "sites belonging to people who dwelt below ground," and this equals "Pit-dwellers." Another name they call them by is *Toi chisei kotcha utara kot chisei kot, i.e.*, "house sites of people who had earth houses" Thus then we have the "Pit-dwellers" for certain. But who were they who dwelt in the pits? To come down to living present day examples of them we have them on the island of Shikotan. These people have two kinds of houses, one built on the Japanese model and the other on the pit model. The pits are only for winter use while the Japanese houses are used during the summer. These Ainu were brought down from an island in the Kurile groupe called Shimushir in the year 1885 by the Japanese Government, and they declare that their forefathers came from Saghalien. They were Greek Church Christians. There are also Ainu to-day inhabiting Saghalien who live in the same kind of pits during the cold weather. Hence we find that the Ainu are, some of them at least, actual "Pit-dwellers" to-day. I myself am a "Wood-house dweller," for my house is made of wood; my brother in Africa is a "Stone house dweller;" his house being built of that material; another brother used to be a real "Cave dweller" for he, being a Royal Engineer, lived for some time in the Rock of Gibraltar; our Mother must be a sort of mongrel for she is living in a house made of brick, wood, and plaster after the Queen Elizabeth style: but for all that we are English to the backbone every one of us!

Referring again to the Ainu of the Kurile groupe, I was very much struck a short time since by reading what Mr. Romyn Hitchcock has said in his Paper entitled "The Ainos of Yezo, Japan," which will be found in the Report of the National Museum for 1890—Smithsonian Institution, pages 429-502. On page 432 will be found this most astonishing remark: "The so called Kurile Ainos are wrongly named. This name is given to the pit-dwellers of Shikotan, who are quite distinct from the Ainos." Well, I have myself spoken with Shikotan Ainu but the language was Ainu and Japanese and nothing else, unless it were perhaps a word or two of Russian thrown in. Moreover, I have this day (March 28th, 1904) been into the Government offices at Sapporo and reinvestigated the whole matter. The results are: *1st*

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a reaffirmation of the fact that the Kurile islands were ceeded to Japan by Russia in exchange for Saghalien in the 8th year of Meiji; *2nd* that in the 17th and 18th years of Meiji the pit-dwellers of Shikotan were brought by the Japanese Authorities from the island of Shimushir in the Kurile groupe and settled there; *3rd* that these pit-dwellers were Ainu and spoke the Ainu language; and *4thly* that those who are left of them still have dwelling-pits for winter use. Mr. Hitchcock's remark must therefore be dismissed as misleading and inexact.

Secondly, there is the question of the ancient Japanese name *Tsuchi gumo*, "Earth-spiders," and *Ko-bito*, "Little people," applied to these pit-dwellers. And besides, the Ainu themselves sometimes talk about the "little men." But nothing of value can be made out of the appellation "Earth-spiders," for it implies no more than what is meant by "pit-dwellers." *Ko-bito* really means "little people," "dwarfs;" but the Ainu, when speaking of these so-called "dwarfs" use the word *Ko-bito*, which is pure Japanese. I have never heard a real native Ainu name applied to them. In fact, I am of opinion that they have none. Were it not for the Japanese words *Tsuchi-gumo* and *Ko-bito* I have no grounds for supposing that the Ainu would speak of a race of dwarfs at all. But foregone conclusions are always hard to kill, so that it will be asked again, "but were there not the *Koropok-guru* here and does not that mean "the people of the Petasites* plants?" Well; *no it does not. Koropok* cannot mean Petasites: it can only be translated by "under," "beneath," "below." The full name is *Koropok-un-guru*, "persons dwelling below," the *un* being a locative particle. And this it will be seen does not carry the idea of "Dwarfs" in it at all. But allowing for the sake of argument that *Koropok-guru* did mean "people under the Petasites" even that would not dwarf them in the least. I myself stand nearly 5ft. 8 and have scores of times not only walked but also ridden on pony back among the leaf-stalks of the Petasites without touching the blades. I wonder how big the ancient Japanese and Ainu must have been! For if because the ancient pit-dwellers could move among the stalks of the Petasites without touching their over-shadowing tops they were called "Dwarfs," those who for this reason first applied this name to them must have been very Goliaths in stature!

Nor can anything be said for the third argument, viz., that resting on old kitchen middens and flint implements. For (*a*) when one meets with children—Ainu children—playing at making pottery out of soft clay and ornamenting their handiwork with patterns found on the samples dug up from the earth instead of with ordinary Japanese figures, (which ornamentation was done by means of grass and sticks); and (*b*) when one is emphatically told by the Ainu that their ancestors used to make pottery and use flint implements; and when (*c*) we moreover hear in old Ainu songs and traditions

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* I have hitherto called this plant "Burdock." This is wrong. Prof. Miyabe has kindly shown me it should be *Petasites japonicus*, Miq. Hence I take this opportunity of correcting my error. I also tender my best thanks to Prof. Miyabe for kindly reading the proofs and correcting all the botanical names which appear to this brochure.

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of Ainu stone armour and stone-headed spears and arrows, all faith in these things as proofs of a race here anterior to the Ainu finds no place in the mind.

Again, it was shown above that the Shikotan pit-dwellers are Ainu. There can be no doubt on this matter. Now, I have in my hands an Officially printed Report on Northern Chishima, *i.e.* on the Kuriles. In this report there are a number of photos of the people, their pits with the roofs on and the entrances plainly visible, and of their implements:—of implements still used by them when their photographs were taken. A list of the implements is also given and the division is as follows. (1) *Stone implements*:—Axes, hoes, knives, and stone staves. For some reason the arrow-heads seem to be left out although a photo of an example is given. (2) *Bone instruments* (whale bone):—Spears, hooks, needles, combs, mortars. (3) *Earthenware*:—Saucepans, basins, cups. The photos were taken in the 33rd year of Meiji (1900), and the report was made up the following year.*

A question has often presented itself to my mind with regard to the kitchen middens as proof of antiquity. It is this. These pots, jars and cups are made of sun-dried clay, not burnt. I cannot think that sun-dried vessels could last under ground in a damp climate such as this for many hundreds of years. Surely the frost and dampness would tend towards their rapid resolution into the soil.

But then *Fourthly* there are the place-names. Yet even these must be given up. In the Memoirs mentioned above Prof. Chamberlain catalogues 210 real native names out of which the meanings for 99 only could then be supplied. Well then might the Professor ask—"Why should not some have descended from the aborigines who preceded the Ainos, the latter adopting them as the Japanese have adopted Aino names?" But this was in the year 1887 when our knowledge of the Ainu tongue was only just beginning. At that time I could have asked the very same question; indeed, if I remember rightly, Professor Chamberlain and I did talk the matter over together at Horobetsu just before the memoirs were published. Since then some progress has been made in these studies, and I can no longer ask such a question. I have studied Mr. Chamberlain's list very carefully on the spot with the Ainu, the result being that the real root meanings of the whole 210 with some 90 others have been given below.

But lastly one would imagine that if a race distinct from the Ainu once dwelt here some human remains would be forthcoming. I have made careful inquiries on this point and find that no signs of any have yet been discovered. Old pits and graves have been dug into but the results have always been the same: that is to say, the skulls and bones exhumed have invariably proved to be Ainu. The skeletons of no dwarfs have yet been found.

In making my list I have partially followed Professor Chamberlain's excellent plan. That is to say, I have first written the present Japanese pro-

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* Since this paragraph was written a very interesting work by Mr. R. Torii (in Japanese) on the Chishima Ainu has been placed in my hands. This book was published in July, 1903, and fully bears out what I have written. Both it and the Official Report above referred to independently and fully overthrow Mr. Romyn Hitchcock's bold assertion.

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nunciation (omitting the Chinese idiographs with which they are written and their meanings as having nothing to do with Ainu), and then given the real Ainu; then I have parsed it and given its root meaning as well as in some cases pointed out its applicability to the place in question. One thing, however, should not be overlooked, and that is the fact that the Japanese have in some cases taken the name and applied it to a locality perhaps some miles away to which it can by no manner of means apply. But this does not spoil the word or name as an Ainu cognomen.

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PART II.

A CRITICAL EXAMINATION

OF THE

NOMENCLATURE OF YEZO.

Jap'se Pronunciation.	Ainu Form.	Derivation and Meaning.
Abashiri	Apa-shiri kotan	"Fish-spear-head land." *Ap* is the head of a fish spear: *a* is a singular form of the verb of existence. By another derivation this name may mean "Door-land." Possibly the entrance from Saghalien. *Apa* means "door-way" or "entrance," "the open mouth of a river."
Abetsu	A-pet	"The river tine." *A* is a prong of a fork or "tine": *pet* is "river."
Abira	A-pira	"Tine cliff." *Pira* is the usual word for "cliff."
Abuta	Ap-uta kotan	"The place of fish-spear-heads." *Ap* "fish-spear-head:" *u* a plural form of the verb of existence expressing the idea of mutuality; *ta* a locative particle. This village is so called on account of some prominent rocks close by which much resemble fish spear-heads in shape. There is also an *apu* which means "floe" or "broken up sea ice," which word is also used in Saghalien.
Aibetsu		There are four places called by this name among the Japanese each of which is different in Ainu. The first is *A-pet* "the river tine" given above. The second is *Ai-pet* "the river arrow" or "thorn." The third is *Aibe-ush-nai* "the stream containing the sea-ear (*Haliotis tuberculata*). The fourth is *Ai-pet-ush-nai* "the valley containing the river arrow."
Aikapubetsu	Aikap-pet	"The river *Pecten.*"
Ainomanai		This should be either *Ainu-oma-nai* or *Ai-oma-nai.* The first name means "Ainu-valley" and the second "thorn valley." *Oma* means "to be in" and "to be contained in."
Akan	Akan-pet	"The made river." The bed of this river is said to have been formed by sudden volcanic action.
Akkeshi	Akkesh-i	"The place of oysters." At this place there are some very extensive oyster fields, hence the name. *Akkesh* is "oyster," and *i* is an ordinary locative particle.
Anekarimbaushi	Ane-karimba-ushi	This name may mean either "the place of little cherry trees" or "the place with the thin circle." *Ane* means "thin:" *ushi* "place:" but *karimba* may be either "a cherry tree" or "to circle."
Aomori Awomori	A omori	"The protruding hillock;" or "the place bearing the little hill."

Jap'se Pronunciation.	Ainu Form.	Derivation and Meaning.
Aoshuma	Ai-ush-oma-i	"The thorny place." The addition of *ush* to nouns is one usual way of forming adjectives out of them.
Araomaibetsu	Ara-oma-pet	"Forceps river." *Ara* is also applied to the pinchers of an earwig. There is an *ara* which means "beautiful," and another which means "one of a pair."
Araweotsugawa	Arawe-ot-pet	"Scum river." *Ot* like *at* is a plural the one of *an*, and the other *o*, "to be" and to "contain."
Arikawa	Ara-pet	Either "the beautiful river" or "forceps river" possibly "earwig river;" or "the one of two rivers."
Asari	Asari-pet	"The open river." The roots of this word are *sara*, *v. i.* "to open up:" *a*, a passive and intransitive prefix: and *i* a locative particle. The final *a* in *asara* is elided according to Ainu grammatical rule.
Asari	Asar-i	"The open place" *i.e.* open to the skies.
Ashibetsu-nobori	Ashbe nupuri	"Dorsal fin mountain," so called from its form.
Ashoro	Ash-so-oro-pet	"The river with the standing waterfall." But *so* may mean simply a "bare rock" as well as "fall."
Atchi	At-chi-kotan	"The place of elms: *chi* is a plural suffix.
Atsukaripinai	At-kari-pi-nai	"The tiny string-like stream." *At*, "a string"; *kari*, "by way of"; *pi*, "tiny"; *nai*, stream or valley.
Atsubetsu	At-ush-pet	This may be either "Elm river," or "Thong river"; and may thus refer to the existence of elm trees in the locality or tributaries to the river.
Atsukarushi	At-karush-i	"The place of elm mushroom." Fungi are almost always named after the tree or kind of soil they grow on. Thus:—"Oak fungi"; "fir fungi"; "manure fungi" and so on.
Atsuta	Ahachita	"The place of digging up hog-pea-nuts" (*Amphicarpaea Edgeworthii*, *Benth. var. japonica*, *Oliver*). *Aha* is the "hog pea-nut", and *chita* means "digging up."
Awonai	A-o-nai	"A gully", lit: "dug-out-valley."
Azuma	At-ma	This may mean either "The shining lagoon" or "the shining peninsula", *ma* meaning "lagoon" when applied to water," and "peninsula" when applied to land. But *at* may have three meanings, viz, "to shine"; "a thong," "lace," or "string," and lastly it may possibly be the plural form of the verb *a* "to be." Thus the meaning may be either "the place of the lagoons" or "peninsulas"; or "the shining lagoon" or "peninsula"; or "thong lagoon" or "peninsula."
Azabu	Asap-nai or Asapp-nai.	"Paddle valley" or "paddle stream."
Bakkai	Pakkai shuma	*Pakkai* means "to carry a child on the back," and *shuma* is "stone." Hence "The stone

Jap'se Pronunciation.	Ainu Form.	Derivation and Meaning.
		which carries a child on its back." This is the name given to a large stone standing upon the sea coast having a smaller one leaning on it after the manner of women carrying their children when travelling. It quite describes the appearance of the stone when seen from a distance.
Bebetsu	Pepet-kotan	"The wet or marshy place."
Benkei saki	Penge-not	"The upper cape." *Penge* means "upper" in contradistinction of the "lower" part of a river or mountain or portion of the sea coast. *Not* means "jaw," and is applied to "blunt capes." The correlative term for lower is *Pange*.
Betchaku	Pet-chak-kotan	"The dry place," or "the place without a river." *Pet* besides meaning "river" also means "wet." The roots are *Pe*, "water" (almost always undrinkable), and *ot*, "to be." *Chak* means "without" and *kotan* "place" or "village." But this may also mean "the place where the river pops out."
Bibai	Pipa-i	This name may mean either "the place of the swamp" or "the place of the bivalve Anodonta."
Bibaushi	Pipa-ushi-i	"The place of the bivalve Anodonta." *Pipa* is the Anodonta, *ushi* is the "place where anything is." The *pip* in the previous word most likely means "swamp."
Bibi	Pip-i or Pepe	If *pip-i*, "Swamp place," but if *pepe*, "damp" or "watery."
Biratori	Piratoru kotan	"The village by the path of the cliff lake." The village is said to have been so called because of a large lake which once existed near the place. The remnant of the lake, which I myself saw some 26 years ago, has now been completely washed away by the floods.
Biro	Piro-nai	"Cliff valley." In full this name would be *Pira-o-nai*.
Birofune	Piro-puni-kotan	"The place of raised cliffs." *Puni* means "lifted up."
Birotsunai	Piro-chi-nai	"The valley of cliffs," the particle *chi* being a plural ending to the nown *pira*. *Cha*, *chi* or *t* are all plural endings.
Byei	Piye-pet	"The river fat." *Piye* is the word used for the fat of birds and animals, and in this instance the name has reference to the colour and density of the water in the river so called."
Chietomai	Chi-etu-oma-i	"The place containing the sharp cape." *Chietu*, "a sharp cape," *oma*, "containing," *i*, "place." A blunt cape would be *chinot*.
Chikabira	Chikap-pira	"Bird cape."
Chikanai	Chik-an-nai	"Dripping valley." *Chik-an* is the intransitive form of *Chik*, "to drip."
Chikaputomushi	Chikap-toma-ushi	"The place of the yellow star of Bethlehem," (*Gagea lutea Roem. et Sch.*)

Jap'se Pronunciation.	Ainu Form.	Derivation and Meaning.
Chikabumi	Chikap-uni	"The home of the birds." Said to have been so named because storks and other large kinds of birds used to breed here in great numbers.
Chikauchi	Chik-a ot-i	"The dripping place."
Chikisappu	Tuk-e-sap	"The projecting descents."
Chinomibetsu	Chinomi-pet	"Libation river."
Chin	Chin-kotan	This may mean either "The stretched out village" or "pelvis village."
Chinshibetsu	Chin-shipet	"The great river pelvis."
Chiribetsu	Chiri-pet	"Ditch river," or "ditch waters."
Chirotta	Chirot-to	"The lake containing birds." *Chiri*, "birds;" *ot*, "containing (plural);" and *to*, "lake."
Chitose	Shikot-to	"Rushes lake." *Ot* determines, the *Shik* "a rush" to be of the plural number.
Chiubetsu	Chiu-pet	"Current river." *Chiu* is the same as *Chiwe*, "a current."
Chiuruibetsu	Chiu-rui-pet	"Strong current river."
Ebetsu	E-pet	"Humour river." So called because of the dirty colour of the water.
Ekikomanai	U-kik-oma-nai	"Battle valley." *Ukik* means "to fight one another."
Eramachi	Erem-at-chi-kotan	"The village of rats." The *Chi* in this name is a simple duplication of the *t* in *at*—the plural number.
Erimozaki	Eremu-not	"Rat cape."
Esan	E-san-not	"The projecting cape."
Esashi	Esash kotan	"The place of surf" or "the place of surf rumbling."
Etuchikerepu	Etu-chikere-ushi	"The cape with the land torn off."
Ezo	Isho-moshiri	"The land where there is abundance of game."
Furemappu	Pui-omap-i	"The place with a hole."
Fumbetsu	Humi-pechi-kotan	"The place of the roaring waters."
Furebetsu	Fure-pet	"The red river."
Furan	Huru-an-kotan	"The village by the hill;" or "the village with a hill."
Furanno	Huru-an-nu-kotan	"The hilly place." The *nu* defines the nown as plural.
Furubira	Huru-pira	"The hill cliff."
Fushkobetsu	Fushko-pet	"The old river."
Futoro	Pit-oro-kotan	"The place of pebbles." *Pit* is a small stone.
Fuyujima	Pui-shuma	"The stone with a hole" or "cavern" in it.
Habomai	Hap-oma-i	"The place of the herb *Heracleum lanatum, Michx.*" This herb is by some called *Hara*, by some *Hap*, and by some *Pittok*.
Hamamashke	Ma-shike	"The spread out lagoon" or "peninsula."

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Jap'se Pronunciation.	Ainu Form.	Derivation and Meaning.
Hirakishi	Pira-gesh-i	"Cliff end."
Hiramura	Piratoru	See Biratori.
Homme	Humne-pet	"The broken river." *Humne* means "small pieces."
Horobetsu	Poro-pet	"The big river." *Poro* means "big."
Horoizumi	Poro-eremu-not	"The great rat cape."
Horomombetsu	Poro-mo-pet	"The big tranquil river," *Mo* means "quiet;" "tranquil."
Horomui	Poro-mui	"The great fan."
Horonai	Poro-nai	"The big stream" or "valley." Among the Saghalien Ainu *nai* means a "large river."
Iburi koku	Ifure-iso-kotan	"The place of the rock which is red." *Fure* means "red," and *ifure* "very red."
Ikutoro	Ik-uturu	"Between the mountain ridges." The word *ik* also stands for the "spine," a "joint," an "inch," or a "division."
Inao-toge	Inao-pira	"Inao cliff." *Inao* are pieces of whittled wood used as fetches.
Ishikari-gawa	Ishikari-pet	"The winding river." *I* an intensifying particle; *shikari*, "to go round."
Isoya	*Isoya* by some and *Isoyake* by others	But both have the same meaning, the *ke* being a locative particle only. It means "The place of the great bare rock," or "The land where there is plenty of game."
Itaki	Itangi-kotan	"Cup village."
Itatatarage	Itaratarage-i	"The shaky place." The district called by this name has some very boggy land about it which trembles very much when walked over.
Iwanai	*Iwa-nai* by some *Iwa-o-nai* by others	The first name means "Rock valley," and the second "the valley having sulphur."
Kabato	Kapato-kotan	"The place of the water lily *Nuphur Japonicum*.
Kakkumi	Kakkumi kotan	"Bucket place," so called because of the conformation of the surrounding mountains.
Kamiiso	Kamui-so	"The great cascade." The word *Kamui* is often used to express beauty and greatness among other things.
Kamoi wakka	Kamui wakka	"Water par excellence."
Kannikan dake	Kanni-kan-nupuri	"Staff mountain."
Karapto	Karapto moshiri	"The country of the descending lakes." Probably there are some highland lakes in *Karafto i.e. Saghalien*.
Kari-futo	Karip-butu	"The mouth of the river wheel," or "The mouth of the hoop."
Karimba yama	Karimba nupuri	"Cherry free mountain."
Kayabe	Kayabe nupuri	"Sail mountain."
Kayanoma	Ki-moi-kotan	"Reed bay village." *Moi* really means a "quiet place," and is applied to any quiet, snug place among the mountains as well as to sea harbours or bays.

Jap'se Pronunciation.	Ainu Form.	Derivation and Meaning.
Kemanai	Kema-nai	" Foot stream " or " valley."
Ki	Ki-i	" The place of rushes."
Kiitap	Kitap	" Reed hill." *Tap* is a single mountain peak.
Kikonai	Ki-oma-nai	" Reed valley."
Kinatoshi	Kanat-ni-ushi	" The place of the *Cephalotaxus drupacea.*"
Kinaushi	Kina-ushi	" The place of grass."
Kochikabaki	Ko-chikap-ak-i	"The place where birds are shot."
Koitoi	Koi-tui-kotan	" The place torn by waves." *Koi,* " the waves of the sea," *tui*, " to cut " or " tear."
Kokipiru	Pok-pira	" The under " or " lower cliff."
Konoi	Kombu-moi	" Sea-weed bay."
Kotanbetsu	Kotan-pet	" The village river."
Kotoni	Kot-on-i	" The place of the dyke."
Kudo	Ku-to	" Bow lake."
Kumaishi	Kuma-ush-kotan	" Bar village " or " rail village."
Kunashiri	Kunna-shiri	" Black land."
Kunnebetsu	Kunne-pet	" The black river."
Kushiro	Kush-ru	" A passage." " The way through " (presumably from *Apa-shiri* to the South-east coast.)
Kusuri	Kusuri-kotan	" The place of hot springs." " The medicine place." *Kusuri* is said by the Ainu to be an Ainu word and not distinctively Japanese.
Makaribetsu	Makkari-pet	" The river which circles back." From *Mak,* " back ; " *Karip,* " a wheel," and *pet.* The root *kari* also occurs in the name *Ishkari.*
Maonai	Mau-nai	" Windy valley " (*Mau* may also mean the " beash rose " (*i.e. Rosa-rugosa.*)
Mashke	Meshke-i	" The place of the land-slip."
Matsukotan	Mata kotan	" Winter village " or " winter residence." Probably referring to the pits the Ainu used to inhabit during the winter months.
Matsumai	Mat-o-ma-i	" The place of the lagoons " or " peninsulas." The *t* determines *ma* to be plural.
Meakan	Me-akan-pet-nuburi	" The mountain of the cold made river." *See akan-pet.* (But the *me* in this name may be Japanese, and if so it means " female ").
Memnai	Mem-nai	" Pond valley."
Mena-mura	Mena-kotan	" The village by the pond," or " Pond place." But it may also very well mean " The damp place."
Menashi	Mena-sara-nai	" The valley of the *Lathyrus maritimus.*"
Mitsuishi	Pitushi	" The place of pebbles."
Moireushi	Moi-reushi-kotan	" Stopping place bay."
Moiwa	Moiwa-nupuri	The mountain with the gradually sloping sides. Or, " The mountain with the easy rocks " (*i.e.* rocks easy to climb.)

Jap'se Pronunciation.	Ainu Form.	Derivation and Meaning.
Mombetsu	Mo-pet	"Slow river."
Mori	Mori	"The little hill," or "the gentle slope" or "the hillock."
Mororan	Mo-ru-ran-kotan	"The village of the gently descending road." A very good description of the old road over the mountains to old Moruran.
Mōseushi	Mose-ushi	"Nettle-fibre place."
Motta	Motta-moshiretu	"Adze cape."
Mukawa	Muka-pet	"The stopped up river." So called on account of the large quantity of sand which collects at its mouth at each rising tide.
Namewakka	Nam-wakka-kotan	"The place of cool water."
Nanai	Nam-nai	"The cool stream" or "valley."
Nanaye		
Nemoro	Nem-oro-kotan	"The place of ponds" or "swamps."
Nigori kawa	Yu-un-pet	"The river having hot springs in it."
Niikappu	Ni-kap-kotan	"The place of the tree bark." Bark fibre was formerly used in making Ainu cloth.
Nina	Nina-kotan	"Sole fish village."
Nioi	Ni-o-i-kotan	"Forest place." *Ni* means "trees."
Niptani	Niptani by some and Miptani by others	The *niptani* is a raised platform the Ainu hunters make in the forests upon which to stow such meat as they are unable to carry away on their return from hunting.
Nishi	Nish-kotan	"Cloud village."
Noboribetsu	Nupuru-pet	"The turbid river." So called from the colour of its waters.
Nokapiri	Noka-pira	"Image cliff."
Nokkamappu	Nup-ka-omap	"The place above the plain."
Nopporo	Nup-oro-kotan	"The village in the plain."
Noshappu	Nishtap-u	"Cloud capped mount." *U* like *i* is a locative particle.
Notaoi	Not-ao-i	"The place bearing a cape" or "cape bourne place." The *A* in this name is a passive particle.
Notorozaki	Not-oro-kotan	"The village at the cape."
Notsuke	Not-ushike	"Cape place."
Nottozaki	Not-o-i	"The place bearing a cape."
Notu	Not-o	"The place of the blunt cape."
Nupkibetsu	Nupki-pet	"The muddy river."
Oakan	O-akan-pet-nupuri	"The mountain at the mouth of the made river" (see *Akan-pet*). But the *o* in this name may be Japanese, and if so it means "male" c.f. *me-akan*.
Obihiro	O-pereperup-nai	"The stream with the broken up mouth."
Obirashibe	Opiras-pe-kotan	"The village by the spread out water."
Ochiaibetsu	Ochi-ai-pet	"Arrow-mouthed-river." *O* is the lower end *i.e.* "mouth" of a stream or river.

Jap'se Pronunciation.	Ainu Form.	Derivation and Meaning.
Ochikapaki	O-chikap-ak-i	"The place of shooting birds."
Ofuizaki	Uhui-not	"The burning cape."
Okamoi-zaki	O-kamui-not	"The great protruding cape." There are no expletive words or particles in Ainu; the *o* used as a prefix here means "projecting." For *kamui* as meaning "great" see *Kamiiso* and *Kamui wakka.*
Okompushbe	Ok-un-push-pesh-i.	"The descent of the badly exploded" or "errupted place." Said to have reference to an ancient erruption of a volcano in the district. But by some it is *Ok-un-pesh-be*, and this means "The over-hanging neck" referring to the neck of land at the place so called; and this I believe to be the true derivation of the name.
Okotsunai	O-u-kot-nai	"The valleys where the entrances adjoin," *i.e.* the place where two valleys part off into different directions.
Okushiri	Ok-shiri	"Neck island." *Shiri* is sometimes "land," and sometimes "island."
Ombetsu	O-mu-pet	"The river with a stopped up mouth."
Omoribama	Omori-kotan	"The jetting cape" or "hill." (See *Mori*). *Bama* is the Japanese for *hama*, "sea coast," or "sandy beach."
Onishika	O-nish-ika-kotan	"The village over the clouds." This means that the village so named is situated very high up in the mountains.
Orito	O-rit-o-kotan	"The place having protruding veins."
Osarubetsu	O-sara-pet	"The river with the open mouth." (See *Asari*).
Osatsube	O-sat-nai	"The valley" or "stream with a dry mouth."
Oshamambe	Oshamambe-kotan.	"The village of the sole." The name is said to be taken from the conformation of the land on one of the hills behind the village. But *Oshamambe* may grammatically mean "place where soles abound."
Oshima	Oshma-ushi	"The sunken place."
Oshoro	Ush-oro-kotan	"The village at the head of the bay."
Oshunkushi	Osh-un-kush-i	"The back crossing place." But this name may possibly be *Oshungu-ushi* and that means "The place of fir trees."
Ota	Ota-shiri-etu	"Sand cape land."
Otaru	Ota-ru	"The sand road."
Otōbe	Ota-o-pe	"Water containing sand."
Otobe	Ochi-o-pe	"The stream with several mouths."
Otoshipe	Ota-ush-pe	"Sandy water."
Ōtsu gawa	Ohot-pet	"Deep river."
Ōtsunai	Ohot-nai	"The deep valley" or "stream."
Parato	Para-to	"Broad lake."
Pekereat	Pekere-at-pet	"The shining river."

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Jap'se Pronunciation.	Ainu Form.	Derivation and Meaning.
Penakori	Penak-o-ri-kotan	"The high upper village."
Pitarapa	Pitara-pa-kotan	"The village over the stony place."
Piraka	Piraka-kotan	"The village at the top of the cliff."
Pokkirito	Pok-e-rit-o-i	"The place having veins coming from beneath it."
Poromezaki	Poro-me-an-not	"The very cold cape."
Poromoi	Poro-mui	"The great winnow." This place is so named because the distant mountains suggest a winnow by their conformation.
Porosara	Poro-sara-i	"The great sedge plain," or "the great open place."
Poronobori	Poro-nupuri	"The big mountain."
Raiba	Ra-i-pa	"The head of the low place."
Rampoki	Ram-pok-i	"Under the low place." This is the name given to a place low down under some cliffs not far from Horobetsu.
Rebunge	Rep-un-gep	"The sea scoop." This place is so called because the mountains along the coast here are formed somewhat like a "scoop" or "ladle."
Rebunshiri	Rep-un-shiri	"The island." The word *rep* is "sea," *un* is a locative particle, and *shiri* is "land."
Rishiri	Ri-shiri	"The high land."
Rokke	Rutke-i	"The place of the land slip."
Ruriran	Rui-ran-i	"The steep descent."
Rurumoppe	Ruru-oma-pe	"Brackish water." But this name may really be *Ruru-nup-pe* "Water of the salt plain."
Rusha	Ru-san-i	"The place where the path descends."
Samani	San-mau-ni	"The place of rotten wood" or "the wood washed up upon the sea coast by the waves."
Sannai	San-nai	"The descending stream" or "valley."
Sapporo	Sat-poro-pet	"The river which gets very dry." So called because this river is very broad at places and during the summer months the bed has consequently many dry places in it.
Sarapa	Sara-pa-kotan	"The village at the head of the sedge" or "open plain."
Sara	Sara moshiri	"(See *Saru.*)
Saru	Sara-moshiri	"The country open to the skies." (See *Asari.*)
Sarabuto	Sara-pet-putu	"The mouth of the river Sara."
Saruru	Sar'orun-kotan	Either "the place of cranes" or "the place of sedge."
Sashumbetsu	Sash-hum-pet	"Surge sounding river." So named on account of the noise of the billows of the sea along the coast near here.
Satsuma	Sat-ma	"A dry lagoon," or "pond" or "peninsula."

Jap'se Pronunciation.	Ainu Form.	Derivation and Meaning.
Sawaki	Sara-ki-kotan	"The place of rushes," (*Phragmites communis Trin.*)
Sawara yama	Sarat-nupuri	"The mountain of sedge grass." *At* is the plural of *an* "to be."
Shakotan	Sak-ibe-kotan	"The place of the summer trout."
Shakubetsu	Sak-ibe-un-pet	"The river frequented by the summer trout."
Shari	Sar-i	"The open place."
Shiribeshi	Shi-pet	"The main river" in contradistinction to an affluent.
Shibetsu		
Shibuchari	Shipi-chara-pet	"The river with the stony mouth." *Shipi* are small round pebbles.
Shikabe	Shikambe-kotan	"The place of the albatros." Many of these birds may sometimes be seen along the coast called by this name.
Shikerebe	Shikerebe-kotan	"The place of the *Phellodendron amurense Rupr.*"
Shikerebe	Shikerebe	"Shale" or "broken rocks."
Shikotan	Shi-kotan	"The great," or "best village" or "place."
Shikunoppe	Shik-o-nup-pe	"Water rising from the reed plain."
Shikiu	Shiki-u	"The place of rushes."
Shima	Shuma-kotan	"The place of stones."
Shimamaki	Shimak-mak-i	"The hindermost place."
Shimamaki	Shuma'map	"The place containing stones." In full this is *Shuma omap.*
Shimushu	Shimoshiri	"The great country."
Shimushir		
Shumushu		
Shinekozaki	Shi-meko-not	"The great cat cape." *Mek* is the native word for "cat," *mek* being an onomatopoeia for the cats' mew.
Shinshiru	Shin-shiru-kotan	"The place with the earth rubbed off" or "earth abraded place." *Shin* is the same as *shiri*, "land."
Shintoko	Shin'toko	"The ends or shoulders of the mountains." In full this name is *Shiri*, "mountains as opposed to plains;" *etok*, "the ends;" *o*, "jutting." Shintoko is a place situated above the plains just before entering the pass over the Takapchi range.
Shiokubi	Shi-ok-upipi-kotan	"The place of the great sorrow" (perhaps referring to a defeat in battle).
Shiraito	Shiri-etu	Cape land."
Shirakami	Shirara-kamu-i	"The place covered by the tide." It is very interesting to remark that the Ainu term for "God" is *Kamui*, and means "He who" or "that which covers." The particle *i* is either masculine or feminine or neuter as best suits the context in which it occurs. The root of *Kamui* is *ka* "top."

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Jap's: Pronunciation.	Ainu Form.	Derivation and Meaning.
Shiranuka	Shiraraka	"Over the tide." By some this is *Shirara-ika.* "The over-flowing tide."
Shirao	Shirara	"The tide."
Shiraoi	Shira-o-i	"The place where the tide comes out (over the land)." This well defines the locality for there are extraordinary high tides here on occasion.
Shiretoko	Shiretok-o-kotan	"The beautiful place, or "the place of the jetting land."
Shiribeshi Shiribetsu	Shiri-pet	"The great river," or *Shi-ri-pet*, "the great high river" (probably up-land).
Shiriuchi	Shiru-ot-kotan	"The abraded places." *Ot* defines the nown to be of the plural number.
Shitsukari	Shittok-kari	"By the elbow."
Shizunai	Shut-nai	"Mountain foot stream."
Shōnai	So-nai	"Cascade stream."
Shiunkotsu	Shum-un-kot-kotan	"The village of the scumbelt." So called on account of scum often seen in a bend of the river here.
Sorachi	So-rap-chi-pet	"The river of the water-falls." From *so*, "waterfall;" *rap*, "to descend" (plural of *ran*); *chi*, a plural particle belonging to the nown *so*; *pet*, "a river."
Soya	So-ya-kotan	"The land of bare rooks."
Suttsu	Shuptu	"The line of the mountain foot," or "mountain feet."
Takkashima	Tokkara-so	"Fish rock." *Tokkara* is a kind of salt water fish. It is called *tsuka* by the Japanese.
Tarumai	Taru-oma-i	"The place of the dug out road." The volcano so called is thought to have this name given to it because there are some very deep path-like gullies in its sides caused by eruptions.
Teine yama	Tei-nai-nupuri	"Damp valley mountain."
Teshio	Tese-u	"Weaving place" or "basket work place."
Teure shima	Chiure-shuma	"Toe stone." *Chiure* and *chieure* mean "toe" in Ainu.
To-asa	To-asa-kotan	"The village by the spread out (*i.e.* broad) lake."
Tobe	To-pe	"Milk," or "lake water."
Tobetsu	To-pet	"Lake river."
Tobitsuomai	To-pit-oma-i	"Pebble lake."
Tohira	To-pira	"The cliff of the lake."
Tobutsu	To-put	"The mouth of the lake."
Todohokke	Toto-ot-ke	"Thicket place." From *todo* bushes, *ot* "to be," and *ke*, "place."
Topui	To-pui	"Lake hole." But this may be *Top-u-i*, "The place of bamboos."
Togari		See Tokkari.

Jap'se Pronunciation.	Ainu Form.	Derivation and Meaning.
Toishikari	Toi-ishkara-pet	"The very winding river." *Toi* means superlatively. (See *Ishikari*). The final *a* in this name instead of *i* need cause no trouble for *i* is often changed into *a* in Ainu.
Toitanai	Toi-ta-nai	"Earth-dug-valley" or "stream."
Tokachi	Tuk-a-chi-moshiri	"Upward extending country." or "protruding country." Probably so called on account of the numerous mountains in this locality. *Tuk* means "to grow" and to "extend upwards;" "to protrude;" *achi* is the plural of *an* "to be" and is the same as *at* and *ot*.
Tokari Tokkari	Tokkari-moi	"Fish bay." *Tokkari* is the same as *tokikara* and means a kind of fish called *tsuka* by the Japanese. (See *Takkashima*.) Also *Togari* by some.
Tokoro	To-koro-kotan	"The place of the lake." Or it may be "Nipple place."
Tomakomai	*To-mak-oma-i* and *To-mak-o-nai*	The former means "The stream coming from behind the lake" and the latter "the place behind the lake."
Tomanai	Tomam-a-i	"The place of the quagmire."
Tonai	To-un-nai	"Lake valley."
Toshibetsu	Tush-pet	"The rope river."
Tsugaru	Tukara-moi	"Sea-leopard bay."
Uembetsu	Uwen-pet	"Wailing river." Said to be so named on account of many Ainu having died here through small-pox. But the name may also mean "mutually-bad-waters." If so the name is descriptive of the quality of the water.
Uraka	Uraka-kotan	"The rough place."
Urakawa	Urara-pet	"Foggy river."
Uruppu	Urup-pet	"Red salmon river."
Uryu	Uriu	"The high places." The first *u* expresses mutuality and the last is a locative particle.
Usu	Ush-oro-kotan	"The village at the head of the bay."
Usubetsu	Ush-un-pet	"The river at the head of the bay."
Usujiri	Ush-un chiri	"Bay-head-ditch."
Usu-no-yama	Ush-un-nupuri	"Bay-head-mountain."
Utasutsu	Ota-shut	"The sandy mountain foot."
Uyenbetsu	Uwenpet	"The river of bad waters."
Wakasa-nobori	Wakka-san-nupuri	"The mountain down which the water runs." The mountain district so named may be a particularly wet place; or subject to heavy rains.
Wakonai	Wakka-nai	"Water valley."
Wakanai	Wakka o-nai	"Water-bearing valley."
Waonai	Wa-o-nai	"The valley of the green pigeon."
Wanishi	Wan-ushi	"Rim place."

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Jap'se Pronunciation.	Ainu Form.	Derivation and Meaning.
Washibetsu	Wash-pet	"Surf river." So named on account of the surf at the river's mouth. *Wash* is the same as *sash*, and occurs in the word *chi-wash-ekot-mat*, "The goddess of the surf."
Watara	Watara-i & Watara-kotan	"The place of rocks."
Yakoshi	Yak-ushi	"The burst up place."
Yamakoshi	Yam-kush-nai	"The valley of chestnut burs."
Yamani kotan	Yam-ni-kotan	"Chestnut tree village."
Yambetsu	Yam-pet	"Chestnut tree river" But if this is *Yan-pet* it means "the descending river," which I think is the real name.
Yageshiri	Yange-shiri	"The lifted up land." This island is so called because it sometimes has the appearance of being lifted up out of the water.
Yepeotsu	Yepe-ot	"The village with the dirty or fatty water."
Yoichi	Iyochi-kotan	"The dizzy" or "perplexing place."
Yokotsudake	Yuk-ot-nupuri	"The mountain where the deer are."
Yubari	Upara-nupuri	"The spread out mountain" or "Soot mountain."
Yubutsu	Ipot pet	"Face river." I believe the real old name was E-pet put, "pumice stone river mouth." This description exactly agrees with the river whose bed is covered with volcanic ashes. But there is another meaning to *E-pet* (see *Ebetsu*) which also quite agrees with this name.
Yüni	Yu-un-i	"The place where there is hot mineral water."
Yurappu	Yu-rap-u	"The place where the hot waters come down."
Yukchisei	Yuk-chisei	"The deer house."

PREHISTORIC JAPAN.[a]

By Dr. E. Baelz,
1876–1902, Professor, Imperial Japanese University of Tokyo.

As an introduction to the subject of this paper, which concerns the history of primitive Japan as developed from archeological finds, it seems proper briefly to review the types of men now living there and to sketch their origin.

At the outset we may safely affirm that all the race types of which we find remains or traces are represented among the Japanese people of to-day. It is a fact that within the last 2,000 years no conquering peoples have invaded the borders of Japan. Even earlier than that it is probable that only very few large and powerful influxes occurred at any time on account of the position of the country in the midst of a sea where storms and currents prevail. Since the beginning of our records immigration has come solely from the neighboring countries, China and Korea, and for more than a thousand years even this has been too insignificant to be worthy of consideration.

In previous addresses before the German Anthropological Congress in 1885 and five years ago before this society I have considered the eastern Asiatic race peculiarities in detail and have distinguished in Japan three essential elements: First, the north or true Mongolian type; second, the south Mongolian or Malayan type, and third, the Aino type, which is at present becoming less and less frequent. The Ainos were the original inhabitants, but for practical reasons I shall consider them last.

It is hardly possible to draw a sharp line between the Malayan and Mongolian types, as the transition from one to the other all over eastern Asia is so gradual that every attempt to make an exact division has failed. For example, we find in Japan, Korea, and China a large number of people who might be termed pure Malays, and, on the

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[a] Translated, by permission, from Zeitschrift für Ethnologie, Berlin, 1907, part 3, pages 281–310. Read at the meeting of the Anthropological Society of Berlin, May 19, 1906.

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1909.

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other hand, in southeast Asia we may find the most marked slant-eyed Mongolian type, of which the present nominal Emperor of Annam is a good example.

For these reasons the term Austrasian (i. e., eastern Asiatic) race is preferable to the expression "yellow race" used by Cuvier for the combined Mongolian-Malayan races, as it includes people of a dark-brown color in the southern part of the Asiatic continent.

So much can be said, however, that the north or true Mongolian division may be distinguished by their comparatively large size, large head, prominent cheek bones, more or less slanted eyes and meso- or brachycephalic skull, while in the southern or Malay division, smaller size, less prominent cheek bones, and less slanted or more horizontal eyes prevail. Probably there is an admixture of Hindu or other foreign blood in many "Malays."

In Japan these types are seldom found pure; much oftener they are mixed.

The assertion that the Japanese are essentially identical in race with the inhabitants of Korea and the larger part of China was formerly strongly combated. Investigators were too much influenced by outward appearances, especially by dress and methods of wearing the hair. Even such a keen and much traveled observer as Lord Curzon, late viceroy of India, allowed himself to be led astray. He declared that the Koreans were such a characteristic race that it was impossible to confound them with the indigenes of another land wherever they might be met. To contradict this I have the testimony of any number of Japanese and Koreans, that they themselves can not distinguish one from the other if costume and method of hairdressing are the same; and in comparing Japanese and Chinese, the same holds good. Even conceding that the Chinese are generally larger and have softer features, the difference is hardly greater or even as great as between different types in Germany, or between the English and Germans. Therefore I can not understand how Dönitz[a] can say "the Japanese are so different at first sight from the Mongolians who inhabit the neighboring mainland that it is hard to conceive how there could be any direct connection between them." Clearly he, too, had been deceived by outward appearance, especially by the difference of clothing and hairdressing. The sight of Koreans in European dress would soon have changed his opinion.

The natural path for immigration into Japan is through Korea, as a glance at the map shows. This is confirmed by the most ancient traditions of Japan and the finds of the prehistoric period. By this route the people entered who first brought a sort of civilization into

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[a] Vorgeschichtliche Gräber in Japan, Verhandl. d. Berl. Anthropol. Ges. 1887, p. 114.

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the land. They landed on the island of Kiushiu and on the southerly part of the west coast of the principal island, founding a kingdom in Idzumo, the oldest of which any Japanese sources speak. The accounts of this kingdom are mythical, or legendary. Gods, monsters, and miracles play a great part in them, but without doubt there is some historical truth at the bottom. Another early migration of well organized but less civilized people must have been directed to the central part of Japan in the region around Kioto and Nara, which was afterwards the true center of the Japanese Empire for two thousand years.

Probably later than these immigrants came other tribes, either by way of Korea or along the chain of islands made up by Formosa and the Liukiu Archipelago, which joins South China and Japan. The latter route, to be sure, is longer, but it is made comparatively easy by the "Kuroshiwo" or the "black current" which flows in this direction, and by the periodic southwest monsoon of the summer which drives vessels northward, and the northeast monsoon of the winter which enables them to return easily. Whence the wanderers came who traveled by this route—if they did come this way—we do not know. Whether it was from Formosa, or, what is far more likely, from Shantung, or parts of central or southerly China, is an unanswered question. We do know, however, that it is in the southwest part of Japan, where the Kuroshiwo skirts the land, that the so-called Malayan type is most prevalent.

These immigrations, particularly the last one, in all probability occurred in the first thousand years before Christ. That they came from the mainland of Asia is further indicated by the otherwise unexplained appearance at that time in southwest Japan of an iron-age culture too high for Malays of that period. Furthermore, the Japanese language is related to the Turkish, Hungarian, and Finnish; that is to say, to languages spoken by people who had settled in central and eastern Asia. The Turks or, let us say, the peoples of the Turk race, in earlier times made themselves felt more in the east than in the west. Once they invaded Korea with a great army, an attack in which their whole army was annihilated. China also suffered much from their inroads. In the eighth and ninth centuries A. D. they held control of a mighty kingdom in Turkestan. When these facts are considered, the great distance between the present-day Turkey and Japan makes this relationship of speech less strange.

Even before immigration began by way of Korea or from the south, Japan was inhabited by people belonging to an entirely different race, the Ainos, little of whose blood remains in the veins of the Japanese at the present day. Once, as the names of mountains, rivers, and other localities bear witness and archeological finds indicate, they inhabited the whole of the Japanese islands. During the period

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recorded by history they were driven from the northern half of the main island toward the north, till they remained as a pure race only in the island of Yezo. Therefore the Aino type is met more and more frequently in the north of the main island as we approach Yezo, but even in the center of the island scattered remnants are still found. I have been repeatedly surprised at the number of individuals of the pure Aino type that dwell in the barely accessible mountains of the three provinces of Kodzuke, Shinano, and Etchigo. Apparently the uncivilized Ainos, pressed hard by the advancing Japanese, fled hither from all the surrounding territory. In the famous watering place Kusatsu, lying in this region, where the same families have persisted for many centuries without new infusion of blood from the outside, I have seen examples of the most pronounced Aino type.

According to my hypothesis those of the inhabitants of Kiushiu and the Liukiu Islands who are characterized by their thickset build, more or less European cast of countenance, and heavy growth of hair, are also to be classed as the remnants of this or a cognate primitive people. These are the groups designated as Kumaso and Hayabito in the Japanese legends and the oldest historical records.

The intruding Mongolian conquerors first took possession of the plains and the fertile coast region, forcing the aborigines toward the north and toward the wild southeastern region into Kiushiu and the Liukiu Islands, or perhaps sparing them only in these regions. For only in these last-mentioned districts do we find this type at all frequent. It is generally admitted to-day that the Aino is not Mongolian, but is closely related to the Caucasian race. It is difficult to understand how anyone who has seen a large number of pure Ainos could believe them Mongolians.

They now number about 17,000 on the island of Yezo. On Sakhalin they are still fewer. They will soon disappear as a race, not, however, because they will be stamped out by the encroaching civilization, but because they will be gradually absorbed by the Japanese. Intermarriage is now of almost daily occurrence, and the opinion of Mr. B. H. Chamberlain that such marriages are barren is not borne out by the facts. I have myself seen many offspring from such unions. The Japanese type generally prevails amongst these half-breeds.

From what land the Ainos came to Japan we have no idea. We are much more at sea than with those people of antiquity about whom Schiller could say, "Würde die Geschichte davon schweigen, Tausend Steine würden redend zeugen, die man aus dem Schoss der Erde gräbt;" for the Ainos have neither any art nor a written language.

The common hypothesis is that they came by way of Sakhalin, which at a recent period, geologically speaking, was continuous with the mainland and had probably a much milder climate before the formation of Bering Straits. But it is not necessary to go as far as

Sakhalin to meet the possibility of a dry-shod immigration from the mainland.

From the geological history of the British Isles we know the fact that not merely once but twice they were connected with the continent and twice separated from it. The sea floor sank and rose and fell again from 150 to 200 meters. In the Paleolithic age there was no English Channel.

Now, if the sea floor between Korea and Japan lay only 130 meters higher than it does to-day, Japan would cease to be an island. It would be an extension of the continent upon which the people of the Paleolithic and Neolithic ages, even unversed in maritime enterprise, could wander dry-shod. The whole Liukiu chain, too, would have been connected with Japan, and there also we find Aino-like hairy men, whose women folk tattoo their hands just as do the Aino women.

A less widely accepted theory is that the Ainos are related to the primitive inhabitants of Australia. This is founded on the actual resemblance often noted of the two types. On the other hand, there are essential differences.

Now the question is, were the Ainos really the first settlers in Japan or was there another people before them? This latter opinion has several supporters, being vigorously upheld by Mr. J. Tsuboi, professor of anthropology at the University of Tokyo.

In ancient Japanese tales and legends mention is frequently made of the so-called Tsuchigumo—that is, earthspiders or cave dwellers. On the other hand, the Ainos myths tell us of Koropokguru, and also of Kobito or dwarfs. The first is an Aino word, the second a Japanese word adopted by the Ainos. Koropokguru is commonly construed to mean men who lived beneath a certain sort of burdock with enormous leaves (*Petasites japonicus*), and who were therefore very small. But, in the first place, these burdocks grew so large in Yezo that a big man could stand beneath them, and in the second place, according to Batchelor, the highest authority on the Aino language. the word Koropokguru means nothing more than earth dweller, and consequently applies only to the inhabitants of the dwellings known to the Kurile Ainos to this day. It can not therefore be taken as evidence of the existence of a dwarfish race before the Aino.

This is very important, for it concerns the question as to whether the shell heaps found in great numbers all over Japan, with their rich contents of stone implements, pottery, human figures of clay, bones, and the like, are relics of the Ainos or whether they come from a still earlier people who might be considered to have been Koropokguru.

The afore-mentioned missionary, Mr. Batchelor, who lived for thirty years among the Ainos and devoted his life to teaching and studying them, rejects the Koropokguru hypothesis as entirely un-

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tenable from his wide experience. Professor Koganei, of the University of Tokyo, rejects it on anatomical grounds. On the other hand, Professor Tsuboi gives a long list of reasons that make it probable to him that the stone age and shell heap deposits originated from a people different from the Aino.

Most of Tsuboi's arguments are hardly convincing, but it is indeed a noticeable fact that the clay statues of that period do not have distinctly Aino-like features and generally have no beard. Tsuboi formerly held that none of them have beards, but recently has admitted that there are exceptions. He holds to the idea that a people resembling the Eskimos were the makers of these relics, and goes on to mention objects common to the stone-age people and the Eskimos, such as snow spectacles, clay vessels (the present Ainos in Yezo make no pottery), and various unimportant details like form of dress. But according to their own traditions the Ainos did make pottery at an earlier period and we find to-day among the Kurile Ainos the same sort of clay ware as the stone-age people made. Furthermore, clothing, the manner of hair dressing and head ornaments may have changed both among the Ainos and the Eskimos in the course of time. The conception of the rings around the eyes as indicating snow spectacles seems to me rather farfetched. Neither do the clay figures have such heavy clothing as must be expected if the stone-age people of Japan had lived in a climate like that of the present Eskimos. However, I hold to the idea that the Ainos were the makers of these stone-age remains with less certainty than do Koganei and Batchelor, on account of the type of face on the clay figures and the frequent lack of the full beard. Nevertheless these authors have by far the greater probability on their side.

Even if Tsuboi were correct in saying that the stone-age men were a people with little beard and far removed from the Ainos—in fact, if they were truly Eskimos—this would not exclude them from relationship with the present Japanese, for, in spite of their dolichocephalic skulls, the Eskimos stand very close to the north Mongolians.

So much for the race elements entering into the question.

As in most other countries, there are in Japan cave dwellings, sometimes single, sometimes in groups, but the archeological finds in these, as a rule, amount to nothing. The caves are almost all artificial and consist sometimes of a single low room of irregular shape entered through a hole, and sometimes of several communicating chambers at different levels. A cave of 15 square meters floor surface is about the limit in size. The people often call them "devils' caves." I have myself seen some such caves near Tokyo and have found nothing in them. At one place in the province of Kodzuke north of Tokyo there is a large hill honeycombed with these caves, which Professor Tsuboi has described in detail, but here also, all evidence is lacking as to the period and peculiarities of the inhabitants. Perhaps they belonged to the cave dwellers or "earth spiders" mentioned in connection with the victorious marches of the first (legendary) emperor of Japan, Djimutenno.

In later times the caves often served as places of refuge for robbers and fugitives, and it is not at all improbable that during the endless civil wars that raged in Japan in the middle ages many such caves were made as hiding places by vanquished refugees. They are dug in a very soft sandstone easily scratched with the finger nail, and from their position in the wooded foothills of the mountains their origin might at least partly be attributed to such a contingency.

The theory has also been put forward that the caves were catacombs. But even the discovery of skeletons in such caves would not prove that they were the most primitive form of graves, for we know from the history of the Egyptians that they resorted to cave burials only after having erected the most artistic tombs in the open air for thousands of years. In fact, in Japan the rock graves, which occur in the southwestern and middle part of Japan surely belong to a higher period of culture, the iron age. Besides, even in our own time many inhabitants of Tonkin built themselves cave dwellings which could easily be confused with catacombs, although only a generation before they had lived in houses like their neighbors. These modern cave builders were Tonkinese and Chinese irregular troops, called pirates by the French. They dug caves in almost inaccessible cliffs to escape their European enemies. Perhaps in the next decade some learned investigator finding these caves will advance very profound theories about the aborigines of Tonkin. Let us therefore be cautious.

Everywhere in Japan there are shell heaps and other relics of the stone age which give a rich return, and which, as already mentioned, have led to a spirited discussion as to the race of their originators. The first shell heap was found and thoroughly investigated by the zoologist, Professor Morse, in the environs of Tokyo in 1879. The finds were described by him as numerous stone and bone implements, animal and human bones, mollusk shells, and pottery. Most of them are at present in the Imperial Museum at Tokyo. To-day the number of shell heaps and other stone-age sites known in Japan amounts to four thousand.

Even in the very outskirts of Tokyo some have been found, and near the city of Yokohama, close by the race course, I have myself collected a great number of primitive stone implements and pottery. Most of the implements consisted of roughly worked slate. There are among them, however, some well-finished stone celts, so that from the form alone we could draw no division line between paleolithic and neolithic. But, judging from the pottery, this whole culture is neolithic. Less frequently one finds well-fashioned arrow points,

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lance points, knives, and other implements of flint or of obsidian. The quantity of stone implements varies greatly. In some shell heaps they are exceedingly numerous, in others one wonders at their scarcity. Most of the rough tools and weapons are made from the volcanic rock of the neighboring region; others are fashioned from serpentine, granite, gneiss, or other stone. Nephrite is very rarely used. Generally speaking the discoveries of stone weapons of fine workmanship become more frequent as we go north, because the stone age prevailed there long after the more civilized southwest had passed into the iron age. Evidently, however, stone clubs were used in that more civilized region too, for to the first Japanese emperor—supposed to have lived about the seventh century B. C.—is attributed in the oldest legends a song in which he says that he had struck down his enemies with his knobbed stone sword. There are many specimens of stone clubs, up to 80 cm. and over in length. Some of them are of a distinctly phallic shape.

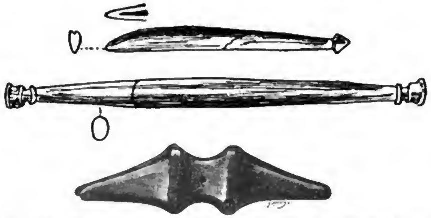
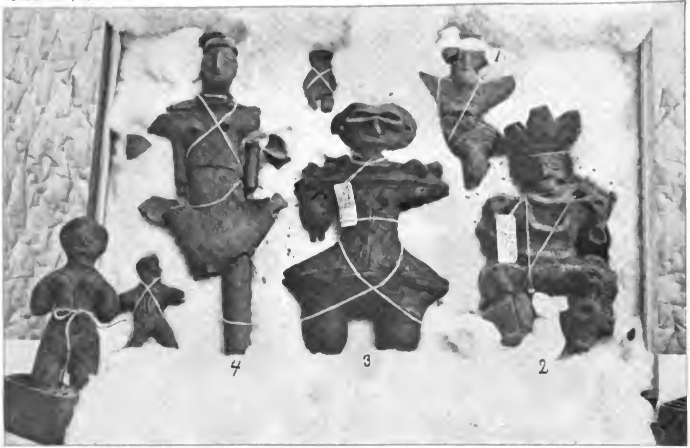


FIG. 1.—Stone weapons. Above a fragment of a stone club (or a commando staff?), which might be restored like the specimen beneath it. Below a beautifully polished pierced double axe.

As has already been stated, the roughly shaped tools form the great majority of the finds. The beautifully polished stone axes occasionally found often taper so little toward the handle that they appear almost rectangular and not trapezoidal in shape. They also occur with one beveled edge like the knife of a plane. Sometimes double axes are found with bored or unbored shaft. (Fig. 1.) Grindstones and the familiar stones with many small pit-like hollows are not common. Net sinkers and whirls are numerous, as is natural from the location of the shell heaps near the sea. The best examples of the pottery of the stone age are also found in northern Japan. It is here, too, where we find most frequently the highly characteristic statuettes of clay. Some of these are of a soft-baked gray clay mixed with animal hair; others are of a better red or black clay. The softness of

PLATE I.



NEOLITHIC JAPANESE CLAY FIGURES, BAELZ COLLECTION. ONE-THIRD NATURAL SIZE.

Figures 1 and 2 have beards. They are made of a soft, poorly baked gray clay. Fig. 3 (feminine) is of black clay, but better baked. Fig. 4 is of terra-cotta color, thin walled and well baked. Its features recall the Japanese Haniwa figures of the dolmen age, which probably were known to the potter.

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the gray figures is responsible for the fact that in spite of all care they do not keep in the same good condition in which they are found. Two of these gray figures, shown on pl. 1, have a full beard. They are the only ones of this sort known; usually the beard is absent or is only indicated by strokes of the modeling tool.

The eyes of the figures are often surrounded by a raised line which is construed to represent snow spectacles by some Japanese archeologists. A further thing to be noticed about the eyes is that they do not slant upward like those of Mongolians, but the lids are horizontal and the eyes are deep set like those of Europeans. Many of the figures are distinctly painted or tattooed on the face.

The gray figures are evidently the most ancient. The better burnt red and black figures are more recent, and some have the type of the Japanese terra-cotta figures of the iron age to be mentioned later, and have slit eyes and the aquiline nose of refined Mongolian type. Their entire workmanship and the care often expended on the clothing indicates a late period, perhaps the first centuries A. D. A few rather good mask-like representations of human faces have also been found.

The numerous handmade clay vessels and pots from the stone age show great variety in form and motive of decoration. They are made generally of a reddish clay and are often very badly fired. As they are usually thin, they break and fall to pieces easily, so that well-preserved pots of large size are rare.

Fig. 2 shows a collection of fragments with different patterns.

The most beautiful and best preserved vessels are found in the northern part, where for the longest period the stone age prevailed. They are sometimes red, sometimes brown, sometimes black, and occasionally gray. Some resemble glazed ware. Most of them are about the size and shape of a modern teapot and have often peculiar forms of spout and lid. (See fig. 3.)

The peculiar rectangular oblong or trapezoidal earthenware tablets should also be mentioned. These are sometimes as large as the hand, and are often decorated with human faces or eyes, or with other more or less fantastic designs. They are supposed to be toys or dolls, on what grounds I am not able to determine. More probably they were charms or idols.

Animal figures are few and small. Bear and bird heads are found, and occasionally fish heads.

Personal ornaments appear in the shape of stone and clay rings, hollow clay tubes, beads of bone and clay, and also the numerous comma-shaped objects 2 to 5 cm. in length, or even longer, which are called magatama (crooked jewels), and which were the most desired and prized personal adornments in Japan well into the his-

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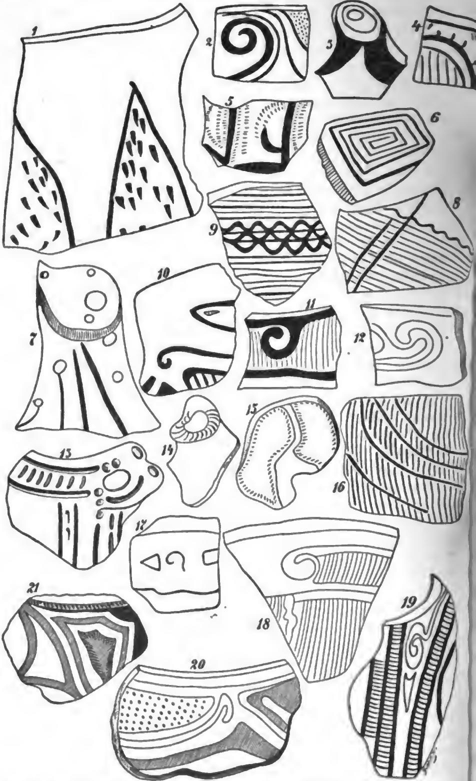

FIG. 2.—Neolithic Japanese pottery mostly from the environs of Yokohama. No. 17 has a script-like decoration. Nos. 8, 16, and 18 have patterns like the Yayoi ware which is attributed to a later period. One-third natural size. Baelz collection.

torical period. In the shell heaps they are of stone, horn, boar or wolf teeth, and in the graves of the iron age of glass, carnelian, rock crystal, quartz, and nephrite. They are generally perforated at the thick end and were worn on a string, together with beads and bugles of the same material, as a necklace. Their peculiar shape has given rise to many conjectures. Probably they were originally teeth or claws of wild animals, which were worn as amulets everywhere in the stone age.

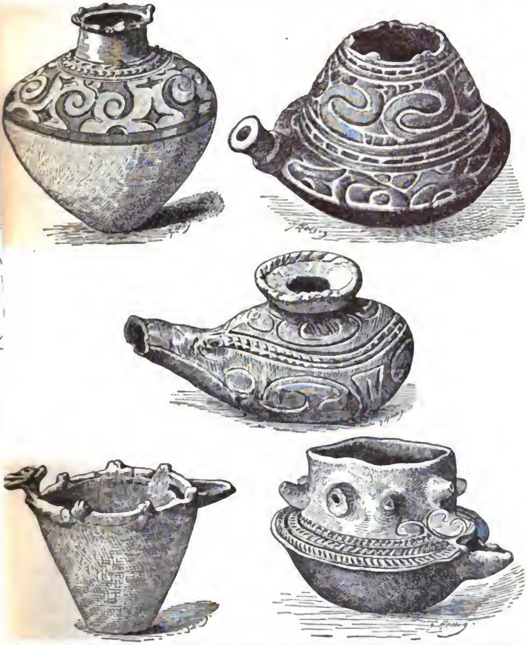

FIG. 3.—Finer and more recent ware from northern Japan. The vase on the upper left hand is one sixth natural size, the others one-half. Baelz collection.

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I show (fig. 4) for comparison a picture of the canine tooth of a wolf (now in the British Museum) from the French paleolithic caves of Laugerie Basse and an animal tooth from a shell heap in Japan. The figures called *c* and *d* are magatama of serpentine or rock crystal from Japanese graves of the iron age. The last form is the most frequent, and it is this form which is commonly meant when magatama are mentioned.

Dönitz thinks that the shape of the magatama indicates a "symbol of lascivious meaning." Others see in it a picture of the wing of a certain butterfly. Sometimes they look like a little fish. My opinion is that originally they were used as charms, either to protect the wearer from the animals from which they came or, in the case of the fish-shaped ones, to attract the fish.

Some special power must have been attributed to them, for their value as ornaments alone does not explain why they were used in mythical or half mythical times as jewels of the gods, of the Emperor, and of other persons of the highest rank. A magatama is even to-day one of the three emblems of sovereignty in Japan. Their religious significance can be seen also from their use in the Shinto ritual and from the further fact that two or three such comma-like figures forming a circle appear frequently on religious and ritualistic objects all over eastern Asia. The circle, made up of two "commas," one red and the other green, is the national emblem of Korea. This form represents the masculine and feminine principles—Yang and Yin of the Chinese—and also heaven and earth. The triply divided circle represents heaven, earth, and man (the product of the two). The Swastika, in my opinion, belongs to the same group of ideas.

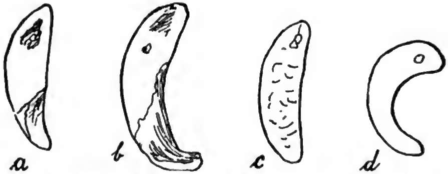

FIG. 4.—So-called Magatama, natural size. *a* is an animal's tooth from Laugerie Basse, in France (paleolithic); *b* is from a Japanese shell heap; *c* and *d* are from the graves of the Japanese iron age (Dolmen period).

Horn and bone are found as implements, such as needles, awls, arrow points, harpoons, pipes, and also, but much less frequently, fashioned into ornaments. The bones occurring most commonly are from deer and wild boars, and occasionally from dogs, wolves, and monkeys. Among the monkeys Professor Morse has recognized a Kynopithecus besides the Macacus found in Japan to-day.

Human bones are found in the shape of fragments of tubular bones, such as the humerus, radius, ulna, femur, tibia, and fibula. Sometimes they are in a condition which points to cannibalism. Only incomplete fragments of cranial and face bones have been discovered.[a] The tibia are very flat, and in this respect the people of the shell-heap period closely resemble the Aino.

The shells of mollusks are naturally found in large quantities. Sixty species have already been determined, which, as might be expected, are distributed in varying numbers in different places. In this connection Morse's observation, that the mollusk fauna of Tokyo Bay has undergone a decided change since the building of the shell heaps, is of especial interest, as it indicates that these are very old. Professor Milne is bold enough to name a definite age—three thousand years. But it must not be forgotten that the bay of Tokyo has changed very much. The whole eastern coast of Japan in that vicinity is slowly rising. A large part of the area of the present city of Tokyo lay under water a thousand years ago, and the hill of Ueno, with its celebrated city park, was an island five hundred years ago. The great inflowing rivers have partly filled up the bay at the north end where the shell heaps examined by Morse lay. Therefore it is quite possible that the smaller percentage of salt in the water and other conditions altered the form, size, and frequency of the conchylia within a comparatively short period of time.

While the remains of the stone age lie scattered promiscuously around in shell heaps, and while no regular graves of that period are known, it is different in the metal age. This period may be divided into two parts, a bronze and an iron age (there has been no distinct copper age in Japan), but while in other countries we often find transitions from stone to bronze and from bronze to iron, the deposits of these three periods in Japan lie unmixed side by side, or one lies on top of the other.

That the people of the metal period were different from those of the stone age is evidenced by this lack of transition and by the distribution of the metal finds. These cease to the northward of Tokyo somewhat beyond the Kwanto Plain just where the region of the Aino began in historic times, and where the stone weapons and the corresponding pottery reached their highest development.

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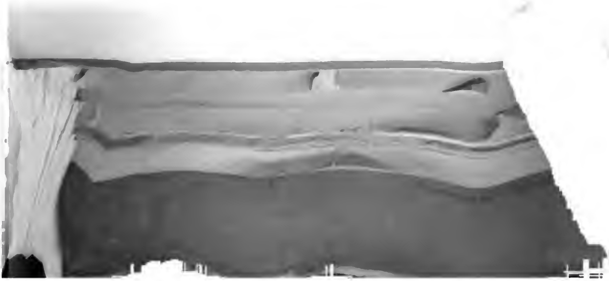
[a] Since the above has been written Doctor Munro, of Yokohama, the distinguished archeologist, has succeeded in exhuming six skulls of the stone age, which in my opinion leave no doubt that the stone-age people were really Ainos.—E. B.



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Tombs containing iron have never been found in this Aino territory, and stone weapons never occur in the graves containing metal.

The real question is whether the bronze-using people are identical in race with the iron people. Even if they are, we must assume that there were two distinct surges of immigration separated by a considerable period of time, the first consisting of people in the bronze age and the second of people in the iron age. The latter immigrants became the masters of the land, and the dolmen graves belonging to them were built even into the historical period. Their sway represents the dawn of twilight of history. There is no doubt but that the iron-age people were the direct forebears of the present Japanese.

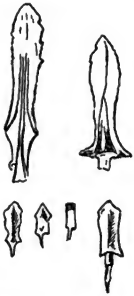

FIG. 5.—Japanese bronze weapons (after Gowland). Above swords or lances, the larger 70 cm. in length. Below, arrow points.

The difference of the bronze and iron age folk appears further probable from the fact that in the oldest Japanese annals (712 and 720 A. D.) the word bronze is altogether absent, unless possibly the word for copper includes bronze. In any case the annals consider iron as the only metal used in swords from the very beginning. Even the sun goddess has an iron sword. The bronze swords discovered must therefore come from another people or tribe, though the race in both cases may have been the same.

That both the bronze and iron people brought their culture from the continent is shown not only by the geographical position of the country and the indications of ancient legends, but also by the nature of the grave deposits.

The bronze age can be disposed of in a few words, for comparatively little is known about it. There are no distinct graves of this period, although bronze weapons and other implements often occur near the surface in fields or clearings of southwestern Japan. Together with them are sometimes found unglazed hand-fashioned cups and bowls of red clay. The bronze swords and lances are double edged, and they are similar to those of the bronze age in Europe. They are often so large that they were perhaps intended for sacrificial purposes rather than for use against enemies. Both these weapons and the rather infrequent arrow points are well finished. The latter are found in the iron-age tombs, whereas the swords of the bronze and iron ages are totally different.

Celts, needles, and fibulæ are not found in Japan. In plowing their fields, peasants occasionally unearth, besides little round bells, very peculiar large flat bells, made of thin bronze, as much as 80 cm. or more in height. That these were intended to be hung up is shown by the hole at their top, but what they were used for and where they came from no one knows. They are generally attributed to Chinese origin. They show finely worked geometrical designs and often quite a number are found together.

The bells occur only in the vicinity of bronze weapons in southern Japan, especially in the part lying nearest the continent. The farther north the less frequently do bronze articles occur, and on the northern side of the inland sea there are none.

Although there can be no doubt but that bronze weapons were cast in Japan, molds for casting swords having been found, it is doubtful whether the bronze itself came from Japan. Several Japanese archeologists think that all bronze was imported from China or Korea. In early times neither copper nor tin mines were known in Japan, and when the first copper mine was discovered there about 700 A. D. it was considered an occasion for national celebration; and yet the bronze age must have antedated this by at least 1,500 years.

Few ornaments of the bronze age are extant. They are principally beads, bugles, or magatama, made of rock-crystal, steatite, and jasper. Unfortunately all discoveries of the deposits of the bronze age were made by accident and by uneducated people, so that a systematic consideration of them is out of the question. The theory is that the places where the bronze pieces are found were originally graves, probably covered by a small tumulus which gradually wore down or was destroyed by the farmer. Whether or not they inclosed sarcophagi of wood or of soft terra cotta can not be determined. If there were any, they have been totally destroyed by the weathering, as have the bones of the persons buried. Anything like a stone lining has never been found.

The iron age in Japan is at the same time the dolmen age. W. Dönitz has described the dolmens in the volume of 1887, page 114, of these Proceedings.[a] But since Dönitz himself only saw a few dolmens which were furthermore empty, little is added to the sum of knowledge by him, especially in comparison with the highly interesting investigations of Gowland, who published the results of his work begun more than thirty years ago in the London Archeologia for 1897. Gowland himself has examined more than 400 of the 1,200 known dolmens, many of which were untouched, and has gathered a valuable collection of objects out of them, now exhibited in the British Museum.

The dolmens in Japan are all megalithic structures and were covered with tumuli, often of large dimensions. If many of them stand uncovered now, it is because the tumulus has been removed by climatic influences or by the hand of man.

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[a] Zeitschrift für Ethnologie, Berlin.

The simple stone chambers, or stone cists—that is, three perpendicular slabs of stone covered with a very large cap stone—are not found in Japan. This is the more remarkable from the fact that in Korea, mostly in the northern part, I have seen a great number of these, while megalithic dolmens appear to be lacking there.

The stones of the Japanese dolmens, particularly the roof stones, are often very large, but regularly hewn stones are the exception. There are, according to Gowland, only four dolmens of the last sort, and they belong to a comparatively recent period. Generally they are put together without any mortar (which, however, was doubtlessly known then) and the interstices filled with small stones.

Occasionally true rock graves are found, graves of regular shape hewn out of the rock. Judging from the finds in them they belong to the dolmen age. They differ in their whole execution from the primitive caves mentioned before.

Gowland differentiates four forms of the dolmens: First, the simple covered passage (allée couverte); second, the covered passage broadening out on one side at the inner end into a chamber; third, the same form with a symmetrical widening out on both sides (this is the most usual form), and fourth, dolmens with two separated chambers one lying behind the other.

It is likely that the last form always represents a later stage of development; perhaps also the social position of the deceased influenced the form.

The chambers are rectangular in shape. The length varies from 1½ to 8 meters; the gallery leading in is often longer. The breadth of the chambers is generally less than 3 meters and the average height about 2 meters, although it may rise to 5 meters. Some of them are vaultlike. The tumulus over the grave is sometimes as large as 30 meters in length and 10 in height, but usually only half that size. The entrance is almost always from the south, though frequently a little toward the east or west. Deviations amounting to 40°, which are observed in the large Japanese dolmen as well as in the small dolmens of Korea, can perhaps be explained from the time of year of the burial. East and west are easier to determine than true south, on account of the rising and setting of the sun. In midsummer the sun rises toward the north, in winter toward the south. If the people founded their orientation on the rising of the sun, as they probably did, south would be too far to the east in summer and too far to the west in winter.

Whether the peculiar position of the dolmen entrances toward the south is to be attributed solely to the sun and its worship, or whether it is based on some other religious or astronomical idea, it is difficult to determine. I may remark in this connection that in China from the earliest times, the Emperor, the representative of heaven on earth, bore the title "The south looking Emperor." The bodies were buried uncremated, but the bones at the time of the examination had usually disintegrated. Where the position of the body could be determined it was generally laid in the direction of the long axis of the structure, that is, north and south. The bodies lay on the floor, which was rarely paved with stones or covered with plaster, but at other times sarcophagi of stone, terra cotta and wood were used.

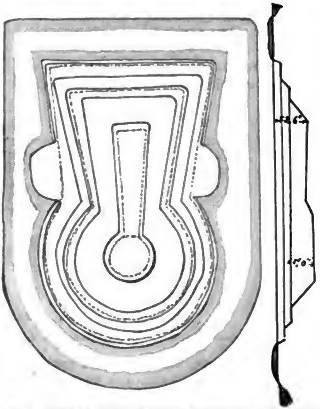

FIG. 6.—Japanese imperial grave (after Gowland). The length of the mound between water surfaces is 674 feet. The outlines of the mound recall the schematic outlines of a human figure. The dotted lines indicate rows of clay cylinders.

One dolmen usually served for only one or two persons. Interment of a larger number was very infrequent and probably indicated a family vault or the death of many from some special occurrence.

A particular form of grave is represented by the imperial graves (Jap. "Misasagi") of the dolmen period. They would be more appropriately termed princely graves, since they do not occur only in central Japan, where the Emperor always lived, but also in all the districts where dolmens abound, and which must be considered as the seats of great feudal princes. These graves are often only a kind of unusually large dolmen mounds, yet they are prominent not only by their often enormous dimensions, but they have other peculiarities. In contrast to the position of the dolmens on hills, these graves lie principally on plains. They are double mounds of a characteristic form (as the accompanying figure by Gowland shows), consisting of a trapezoidal mound flat on top and often terraced, joined to a higher circular one likewise flat on top.

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Around the whole structure runs a large ditch or moat. The orientation of the long dimension is east and west. The entrance to the dolmen is in the south side about a third or half way up the circular mound. It contains one and often two stone or terra cotta sarcophagi. At other times the sarcophagi are buried in the mound without any real dolmen structure. The whole mound is surrounded at different levels by several rows of short, broad, hollow tubes of terra-cotta placed close together. The total number of these often runs up into the thousands. The terra cotta figures, called Tsutshinigyo (earth figures), are also found here, but only a few are preserved, since most of them soon crumble away in the open air.

An idea of the enormous labor which the erection of such grave mounds entailed may be obtained from the fact that one of these misasagi with its moat covers not less than 200 acres.

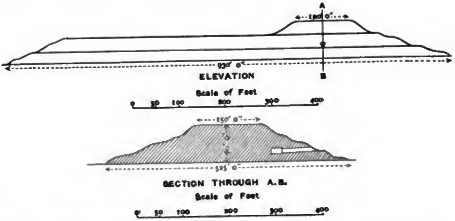
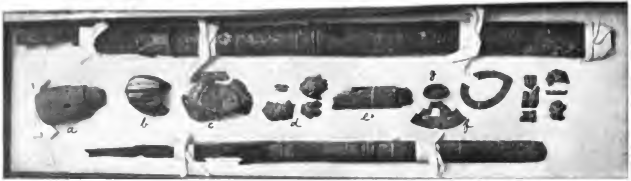


FIG. 7.—Japanese imperial grave in longitudinal and cross section. After Gowland.

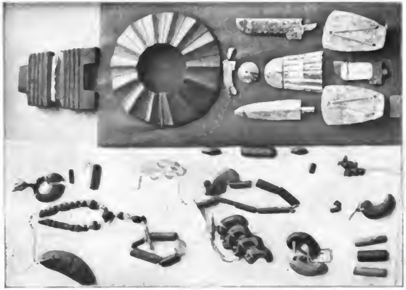
During the many centuries of Shogun rule, when the Emperor was a purely nominal potentate and lived almost a prisoner in his capital, these graves were so completely neglected that farmers laid out fields on some of them. Gowland found the largest grave mound he examined entirely given up to agriculture.

In 1868, however, the Emperor was fully reinstated in his rights and power, and since then all the imperial mounds have been rigorously protected. They are fenced in and Shinto temples have been erected at their foot. They are particularly numerous in the provinces of Yamato and Kawachi, and they have a very imposing and stately appearance as they rise from the plain. Each one is attributed to a special Emperor, but it is doubtful in some cases whether just that Emperor whose name the mausoleum bears lies there.

The objects found in the dolmen or rock graves are very numerous and often valuable from an artistic point of view.



JAPANESE SWORDS AND SWORD FITTINGS FROM GRAVES OF THE IRON AGE (DOLMEN PERIOD). BAELZ COLLECTION.



OBJECTS FROM JAPANESE GRAVES OF THE IRON AGE. BAELZ COLLECTION,
ONE-THIRD NATURAL SIZE.

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Of the weapons the most characteristic are the iron swords, which differ in form as much from the swords of the bronze age as from those of the later Japanese, which, as is well known, curve backward toward the point. The iron swords are perfectly straight, with a hilt long enough for both hands. The length of the cutting edge is generally from 80 to 100 cm., and the grip from 15 to 20 cm. The swords are incased in a wooden sheath. This is often covered by a copper sheath, on which in exceptional cases a gold sheath is hammered, with designs of dragons and other things.

These swords were not thrust into the girdle like the later Japanese swords, but hung at the girdle or belt of the wearer by a loop fastened to two eyelets on the sheath. Iron lances or spears appear to have been little used. Arrow points of iron and pieces of ornamental gilded bronze bits and horse trappings have been found. The Japanese of that time must have been keen horsemen, for such articles are often quite numerous in the more elaborate graves and are of varied and beautiful execution.

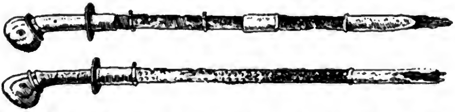

FIG. 8.—Swords ornamented with gold from a Japanese prince's grave. Museum in Tokyo.

Pieces of armor are rare, probably because the iron has been destroyed by rust. The Tokyo Museum, however, possesses some large and well-preserved specimens of iron breastplates and several helmets, one of them finely gilded. Out of the same grave with some of these objects was obtained a pair of perfectly preserved gold-plated copper shoes.

Although iron swords are much more common than bronze swords, it is doubtful in their case, too, whether they were made from native material. No mines nor iron works have been found, and even to-day Japan is a country poor in iron.

It is a remarkable fact that among the gifts of a King of Kudara (in Korea) in the third century A. D. fifty bars of iron are explicitly mentioned. A great many swords could be made from these.

Whatever bronze objects are found in the dolmen graves are in the form of ornaments. Bronze mirrors plainly coming from China (some of them being dated from the Han dynasty, 200 B. C. to 200 A. D.), little bronze bells for horses, horse bits and trappings, and bronze arrow points are among the most numerous. Besides these

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there are gold-plated rings of iron or copper made without soldering, of the same form and technique as those in the more elaborate graves of the bronze and iron age in Europe. Some small rings of solid gold or silver have also been found. Among the other ornaments may be mentioned little thin plates of gold and silver used as trimmings for clothes, glass and stone beads, and bugles. Gowland found no less than 1,018 specimens of these last ornaments in one dolmen grave, together with the comma-shaped magatama already mentioned. The last are not so numerous, however. Steatite, jasper, agate, rock crystal, and occasionally the foreign stones, chrysopras and nephrite, are used for this jewelry. The prevailing colors of the jewelry are blue for the beads and a dull green for the stones. In many graves are found small models in steatite of wooden shoes, combs, spindles, knives, daggers, arrow points, and some radially striped disk-shaped objects, whose significance is not known. They are, from their shape, called wagon-wheel stones by Japanese archeologists.

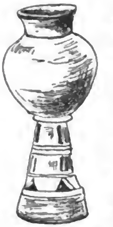

Fig. 9.—Clay vase with perforated base.

The pottery of the dolmens has been described in detail by Dönitz, and the principal forms are figured in his paper already quoted. He rejects the idea prevalent amongst the Japanese experts, of Korean origin or influence in regard to this pottery, as in his opinion the ancient Koreans themselves were unskilled potters, and as the Korean pottery used at the ceremonial Japanese tea ceremonies (cha no yu) was shaped by hand and was of a rough type, while the gray dolmen ware, although mostly unglazed, was always made on the wheel and is of a much higher artistic standing. The cha no yu ware, however, is of a much later date and only part of it comes from Korea, while the clay vessels found in the old Korean graves are unmistakably identical with the Japanese dolmen pottery.

In any case the fact remains that even before Christ artistic and well-formed vessels existed, which were shaped upon the wheel, and yet centuries later potters were brought over from Korea. In Japan itself the best potters must have lived, not in the imperial province of Yamato, but in the distant province of Idzumo, the seat of the most ancient culture, whither the Government sent again and again for potters when they were needed quickly.

In connection with the pretty conical stands or bases of some of the vases with triangular and rectangular holes, I may remark that I have seen in the museum at Cairo very ancient Egyptian clay vases with the same striking ornamentation. Dönitz thinks that the holes were put in to facilitate the baking. Gowland considers them entirely ornamental. Perhaps a fire was made in the cavity to warm the liquid in the bowl or vase on the top.

There is a special sort of pottery which Dönitz does not mention, viz, the clay cylinders and figures which, unlike the gray vessels occurring in the inside of the dolmen, are found on the outside of the imperial double grave mounds. They are made of a poorly baked red terra cotta, and for this reason are much inclined to disintegrate. The cylinders are about 40 cm. high and 30 to 35 cm. in

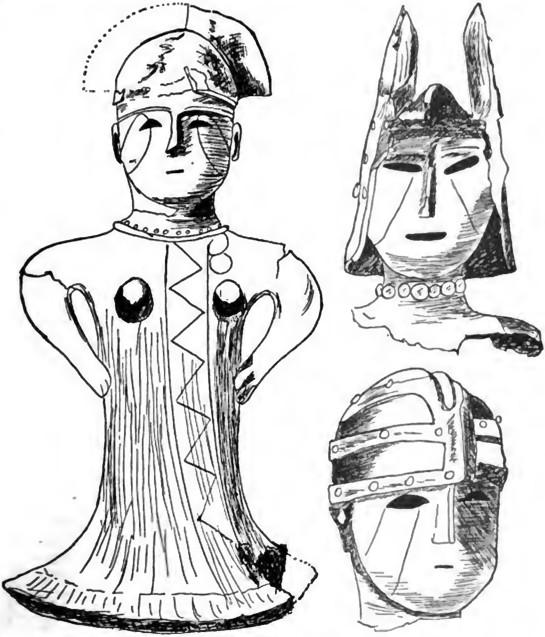

Fig. 10.—Terra cotta figures from princely graves of the iron age. The cheeks are painted red. After Tsuboi: Kokogaku (archeology).

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diameter, and stand by the hundreds or thousands in rows one above the other on the imperial graves. Their purpose is not known. It can, as Gowland says, hardly be to protect the mound from erosion by the weather, on account of their position, and it is also improbable that they were set up or laid there as a substitute for living servants buried with the illustrious dead. On the other hand, we may assume that the less frequent so-called Tsutshi-nigyo (that is, earth figures of men) found with the cylinders served that purpose. As in almost all half barbaric ancient countries, servants and slaves or war captives were killed at the tomb of a prince in Japan in order to serve him in the next world. In Japan this human sacrifice took the terrible form of burying the victim in the earth up to the breast, causing a lingering death from hunger and thirst or suffocation. An emperor is said to have been touched by the cries and groans of these unfortunates, which lasted several days and nights, and therefore, on the advice of a famous official, he issued an edict that in the future the human sacrifices should be stopped and the servants replaced by clay figures which were buried in the tumuli. Probably this was, as in so many other

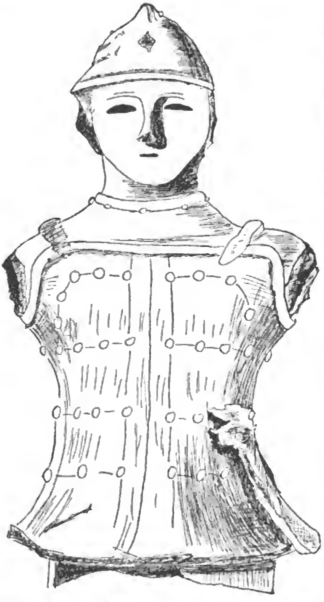
FIG. 11.—Terra cotta figure with armor from the grave mound of a prince. After Tsuboi. Kokogaku.

cases in Japan, an imitation of a Chinese custom, since a substitution of stone figures for human sacrifices is mentioned there much earlier. These "Haniwa nigyo" or Tsutshi-nigyo, sometimes 60 cm. in height, are of value because they show the dress and armor and the ornaments of that period. They are also interesting in that they have the features which distinguish in Japan the refined north Mongolian type, of graceful, slender build, aquiline nose, and narrow slanting eyes, in strong contrast to the stone-age figures previously mentioned.

The horses formerly sacrificed at the tombs were also replaced by clay horses.

The distribution of the dolmens is interesting and at the same time gives an idea of the political and social state of affairs at that time. A glance at the map shows that geographically Japan is divided into two almost equal parts, a western half (somewhat south, to be sure), which includes a part of the main island and the great islands Kiuschiu and Skikoku, and another half running almost north and south, which is made up of the larger part of the main island and of Jezo. The two parts are joined almost at right angles by a broad isthmus at 136–137° longitude east of Greenwich and 34–35° northern latitude. This isthmus forms an important ethnical and civilizational boundary. The bronze culture is absolutely and the iron culture nearly confined to the country west of the isthmus. Northward of it is the main region of neolithic culture; only here are found the well-finished stone weapons and neolithic human clay figures in any quantity. In this large northern territory we find, however, one well-circumscribed oasis of iron-age culture with dolmens—the fertile plain around Tokio with the surrounding mountainous country.

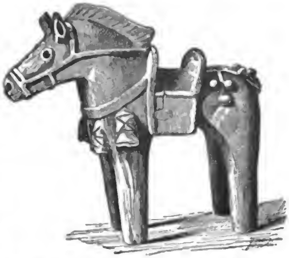
FIG. 12.—Clay horse from the grave mound of a prince of the iron-age Dolmen period.

Besides this isolated group in the north, we can distinguish five other centers for the dolmens, two of which lie in the great southern island of Kiushiu. The smaller one is near the Pacific, in the province of Hiuga, where the grandfather of the first Emperor is supposed to have come down from heaven and whence he is said to have started on his victorious march. This took him first to the north of the

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Kiushiu. Here we find the second large dolmen region, including the island of Tsushima and the provinces lying opposite the southern point of Korea, a region where bronze weapons are especially frequent. This region was afterwards for a thousand years the seat of powerful vassals, who were often enough arrayed against the imperial court. From here, according to the Japanese annals, the first Emperor continued his journey across the bay of Shimonoseki to the main island and marched along the shores of the inland sea. On this road we encounter a third dolmen center in the province of Bizen. The conquest at last reached its goal in the central provinces, the Gokinai, which were from then the seat of the imperial rule for more than two thousand years. It is no wonder then that we find here the fourth and largest of the dolmen centers.

The fifth lies along the northwest coast of the principal island in and around the province of Idzumo, where, as mentioned above, the conquerors already found a civilized people. The sixth is that in and around the Tokyo plain.

Thus the legendary stories of ancient Japanese history are corroborated by the archeological finds. From these we learn that the invaders, a people in the iron-age culture, took possession of the fertile coast stretches in the southwest and spread out to the east and north along the ocean. In Yamato and Idzumo they encountered organized communities of a cultivated and propably related race; these they subdued only after a fierce struggle. The regions where we find the Dolmen centers were ruled by feudal princes who for a long time recognized the Emperor only as primus inter pares, since they were buried in a similar manner as the Emperor himself. Their power was gradually absorbed by the emperors in Yamato, and at last these were able to proclaim themselves "sole rulers by the grace of the gods."

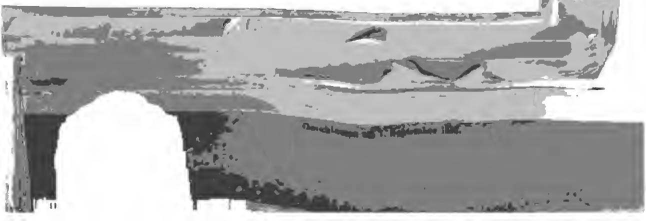
The period of the imperial mounds as well as of the common dolmen mounds which are found in groups of 10 to 200 at the foot or on the slope of hills, probably began at least in the fourth century B. C., perhaps a good deal earlier. Its end is fixed about the year 700 A. D., since at that time an imperial edict was issued forbidding this form of burial. Cremation was then inaugurated under the influence of Buddhism.

It is noticeable in connection with the Japanese dolmens that (1) they are found in neither the stone nor the bronze age, but belong exclusively to the iron age; that (2) they are always of a megalithic nature, simple stone vaults or so-called cists not having been found so far in Japan, although they are numerous in Korea; and that (3) the country where they are found is entirely isolated from all regions with similar structures. It is necessary to go as far as the Caspian Sea or to the northern part of India to find anything like them. But their most similar counterparts existed in prehistoric Northern Europe.

In summing up the whole subject briefly we may say: The oldest inhabitants of Japan known to us, the Ainos, lived in the stone age and have left their traces in the shell heaps and many other places. Formerly they inhabited the whole island, but were gradually pressed towards the north, where the stone age prevailed even within the last thousand years, and where the products of that age reached the highest state of development. The present Ainos make pottery no longer; they have for a long time obtained their pottery and other vessels from the Japanese, when they could not use their own wood utensils.

In the second place, there lived in the southwestern part a people of the bronze age who did not reach the isthmus and the Biwa Lake towards the north. These either drove out or subjugated the aborigines of this region.

Finally there appeared in the southwest a conquering people of an iron-age culture that took possession of the territory of the bronze people and gradually extended their dominion over the whole island empire. In the seventh century A. D. they had only penetrated as far as the region somewhat north of Tokyo, near Sendaig. In central Japan, in Yamato and Idzumo, they had encountered and subdued organized tribes which were not in the bronze age, for there are no bronze weapons found in Yamato. Whether these tribes still used stone weapons or whether, as is far more probable, they already had iron is an open question.



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EARLY MIGRATIONS.

JAPANESE WRECKS

STRANDED AND PICKED UP ADRIFT

IN THE

NORTH PACIFIC

OCEAN,

ETHNOLOGICALLY CONSIDERED.

BY

CHARLES WOLCOTT BROOKS.

SAN FRANCISCO, CALIFORNIA:
Re-printed from the Proceedings of the California Academy of Sciences.
1876.

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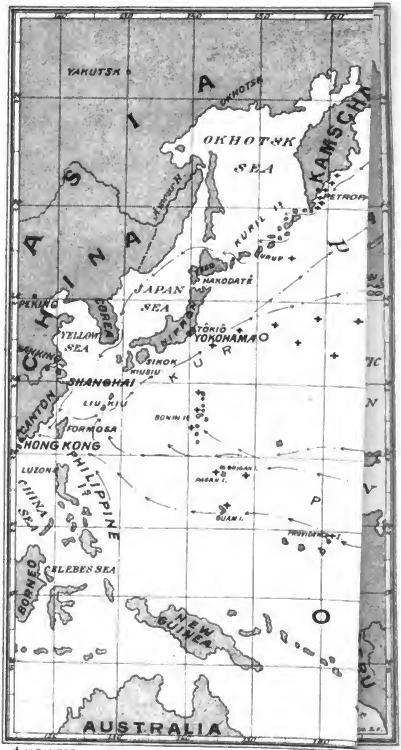

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JAPANESE WRECKS,

STRANDED AND PICKED UP ADRIFT

IN THE

NORTH PACIFIC OCEAN,

ETHNOLOGICALLY CONSIDERED,

AS

Furnishing Evidence of a constant infusion of Japanese
Blood among the Coast Tribes of Northwestern
Indians.

BY

CHARLES WOLCOTT BROOKS,

Member of the California Academy of Sciences; Ex-Consul of Japan for California;
and Attaché of the Japanese Embassy to fifteen Treaty Powers, 1871-72-73.

Read before the California Academy of Sciences, at their Meeting,
March 1st, 1875.

SAN FRANCISCO, CALIFORNIA:
Printed by the Academy.
1876.

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INTRODUCTION.

As nature is a mechanism whose parts are intimately associated, so all work has its co-laborers. I am indebted to many kind friends for their co-operation and assistance in verifying the particulars of individual cases. The collection, as a whole, is entirely my own, and has been progressing since March, 1853, when at sea off the coast of Japan I first fell in with the water-logged wreck of a junk.

In issuing this reprint of a paper published in the Proceedings of the California Academy of Sciences, no one can be more aware than myself, of how much is left undone; but I must in frankness say, that thus far the collection of exact particulars has involved a voluminous correspondence, and been industriously prosecuted, in spite of great difficulties, (often of distance); and had I awaited to obtain perfect completeness, this publication would have been indefinitely postponed.

By calling attention to material already in hand, I hope other cases may be brought to light, and thus a chain of evidence become established, which shall point to hidden laws, underlying the ethnological as well as physical conditions here presented.

With each step in the progress of these investigations, I have been deeply impressed how largely this list is capable of being increased, by studious and systematic search through all the ancient literature, relating to countries whose shores are washed by the North Pacific Ocean.

In the aim to exercise especial care, where partial discrepancies were found to exist, the version which, after diligent examination, appears to me most reliable, has been adopted. Reports of Japanese wrecks not here enumerated, or any well authenticated corrections to this list, will, if addressed to CHARLES WOLCOTT BROOKS, care of Japanese Consulate, San Francisco, California, be thankfully received, and posted in the official record book, accessible to all for future reference.

Among those whose kind co-operation I take pleasure in acknowledging, are: Their Excellencies the Ministers of Foreign Affairs of Japan; His Excellency Kats Ava, H. I. J. M. Minister of Marine; His Excellency Hirobumi Itô, H. I. J. M. Minister of Public Works; Nakahama Manjiro; Fukuzawa Ukitchy, now one of the most advanced literary men of Japan; Yoshinari Hatakéyama, A. M., one of their ripest scholars, and head of the Imperial College at Tokio; and especially to my former colleague and present successor, Samro Takaki, to whom I am largely indebted for many valuable translations and researches into official records; to Professor George Davidson, United States Coast Survey, for reliable information regarding the physical features of the Kuro Shiwo; and to members of the Academy for their kind appreciation of the importance of the work undertaken.

C. W. B.

SAN FRANCISCO, OCT. 1, 1876.

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REPORT

OF

JAPANESE VESSELS

WRECKED IN THE NORTH PACIFIC OCEAN

FROM THE

EARLIEST RECORDS TO THE PRESENT TIME.

Every junk found adrift or stranded on the coast of North America, or on the Hawaiian or adjacent islands, has on examination proved to be Japanese, and no single instance of any Chinese vessel has ever been reported, nor is any believed to have existed.

This may be explained by the existence of the Kuro Shiwo, literally "black stream," a gulf stream of warm water, which sweeps northeasterly past Japan toward the Kurile and Aleutian Islands, thence curving around and passing south along the coast of Alaska, Oregon and California. This stream, it is found, has swept these junks toward America at an average rate of fully ten miles a day.

There also exists an ocean stream of cold water, emerging from the Arctic Ocean, which sets south close in along the eastern coast of Asia. This fully accounts for the absence of Chinese junks on the Pacific, as vessels disabled off their coast would naturally drift southward.

A noticeable feature is the large number of disasters on the coast of Japan in the month of January, during which season the strong northeast monsoons blow the wrecks directly off shore into the Kuro Shiwo.

The climate of Japan is temperate, with the exception of the extreme northern provinces, where intense cold prevails and where snow is abundant; and the extreme southern provinces, whose climate is very warm.

About the year 1639 the Japanese Government ordered all junks to be built with open sterns, and large square rudders, unfit for ocean navigation, hoping

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thereby to keep their people isolated within their own islands. Once forced from the coast by stress of weather, these rudders are soon washed away, when the vessels naturally fall off into the trough of the sea, and roll their masts out. The number, of which no record exists, which have thus suffered during the past nineteen centuries must be very large, probably many thousand vessels.

Among Japanese mariners, the fear of being thus blown off their coast, has been an ever-threatening danger; and the memory of such time-honored accidents, is a common feature in the traditions of every seaport settlement along the eastern coast of Japan.

By the Government Census, taken in 1874, the total population of Japan was 33,300,675 souls, and there were 22,670 registered sailing vessels of Japanese style, (junks) of from 8 to 383 tons, engaged in the coasting trade. The crews of ordinary trading junks average from eight to twelve men each.

In the sixteenth year of the reign of the Emperor Suizin, B. C. 81, merchant ships and ships of war are first spoken of as built in Japan.

Under the Shogoon Iyémitsu, about 1639, edicts commanded the destruction of all boats built upon any foreign model, and forbade the building of vessels of any size or shape superior to that of the present junk.

By the imperial decree of 1637, Japanese who had left their country and been abroad, were not allowed to return, death being the penalty for traveling abroad, studying foreign languages, introducing foreign customs, or believing in Christianity.

The Empire of Japan is situated in the northwestern part of the Pacific Ocean, and is composed of four large islands and of a great number of smaller ones. It faces to the northwest the Kingdom of Corea, and is separated from it by the Japan sea. To the northeast the archipelago of Chijima (Kurile Islands) extends towards Kamschatka. At the southwest the Liu Kiu Islands are situated opposite the Island of Formosa.

Its whole length, extending from one end to the other of the empire, measures more than 500 Ris (about 1225 English miles), and its breadth varies from 20 to 60 Ris (about 73¼ to 146 English miles.) Its total area is 23,740 Square Ris.

The sources of information at command have been exceptionally good. During seventeen years, in which I represented the Government of Japan at this port, it has been my pleasure to devote much critical attention to the subject of Japanese wrecks, picked up adrift in the North Pacific Ocean and stranded upon the northwest coast of America and its various outlying islands, and those of the chain extending from Hawaii towards Niphon. Besides keeping a detailed record of all wrecks reported during this period, I have also collected and verified many cases of earlier reports, which although still extant, were likely to be overlooked.

In at least 37 of the cases quoted, I have either seen the saved, or received a personal account from those who were themselves witnesses. Hawaiian and Japanese traditions I have myself gathered in those countries.

In March, 1860, I took an Indian boy on board the Japanese steam corvette *Kanrin-maru*, where a comparison of Coast-Indian and pure Japanese words was made at my request, by Fukuzawa Ukitchy, then Admiral's Secretary;

the result of which I prepared for the press, and it was at that time published in the *Evening Bulletin*, suggesting further linguistic investigation.

The following examples submitted for consideration to the Academy, fairly illustrate the subject in its various phases:—

1. In Mr. Hubert H. Bancroft's unparalleled collection of ancient books and valuable manuscripts relating to the early history of the native races of the Pacific States, mention is made of several Japanese vessels reported in some of the Spanish-American ports on the Pacific. In 1617 a Japanese junk belonging to Magomé, was at Acapulco.

In 1613, June 10th, the British ship *Clove*, Capt. John Saris, arrived at Nagasaki, having on board one Japanese, picked up from the island of Bantam.

2. "In 1685," we read, "the Portuguese tried for the last time to re-establish their trade by sending back a number of shipwrecked Japanese, picked up adrift, to their own country. The Japanese did not molest them, but strictly prohibited their re-appearance on the Coast of Japan."

3. In 1694, a Japanese junk from Osaka was driven by adverse winds and weather and stranded on the coast of Kamschatka, at the mouth of the river Opala, on the south of Bolschaia Reka. The only survivor was afterwards taken to Moscow.

Muller, in his "Voyages from Asia to America," published in 1761, remarks that when in 1696 the Russians reported the above, they said: "we have learned of several other instances of Japanese wrecks previously stranded on the coast of Kamschatka."

4. In 1710, a Japanese junk was stranded on the coast of Kamschatka, in Kaligirian bay, north of Awatscha. Ten persons landed safely, of which four were killed and six taken captive in an encounter with Kamschadels. Subsequently four of the captives fell into Russian hands, and one named Sanima, was sent in 1714 to St. Petersburg.

5. On the 8th of July, 1729, a Japanese junk called the *Waka-shima* of Satsuma, in distress, after having been driven about at sea for six months, was finally stranded on the coast of Kamschatka, south of Awatscha bay, and 17 of her crew were saved. She was loaded with cotton and silk stuffs, rice and paper; the two latter articles shipped by *Matsudaira Osumi-no-kami*, (Prince of Satsuma) were government property.

A petty Russian officer named Schtinnikow, desiring to plunder the cargo, had fifteen of the survivors shot; for which crime he was subsequently condemned and hung. The two remaining, an old merchant named Sosa and a young pilot Gonsa, were sent to Irkutz in 1721, and thence via Tobolsk, they reached St. Petersburg in 1732, where one died in 1736, the other in 1739.

6. In 1782 a Japanese junk was wrecked upon the Aleutian Islands, from which the survivors were taken in one of the Russian-American Company's vessels to the town of Ochotsk, and thence to the inland city of Irkutsk. In 1792, the Governor-General of Siberia ordered the transport *Catherine*, then at Ochotsk, to return these men to their native country. The Russian vessel, after wintering in a harbor at the north end of Yeso, proceeded to the port of Hakodaté, where the Japanese officials politely but

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firmly refused to allow their countrymen to land. They were subsequently returned to Siberia.

7. Among items of history mentioned in Japanese records, I find that in October, 1804, a Russian frigate commanded by Capt. Krusenstern, conveying Count Resanoff, as Ambassador of the Czar, brought back to Nagasaki five Japanese seamen, being part of a crew of fifteen rescued from a stranded junk; the other ten preferred to remain in Siberia.

8. In 1805, a Japanese junk was wrecked on the coast of Alaska, near Sitka; the seamen were quartered on Japonski Island, whence they were taken by the Russians, and finally landed on the Coast of Yeso in 1806.

9. In 1812, Capt. Ricord, commanding the Russian sloop-of-war *Diana*, took seven Japanese, six of whom were seamen recently shipwrecked in a junk on the coast of Kamschatka, in the hope of exchanging them for seven captive Russians, confined in Japan. Being unable to land, they were returned to Kamschatka, reaching there October 12th. The *Diana* made a second attempt, and finally succeeded August 16th, 1813, in landing these Japanese at Kunashie Bay, the 20th Kurile, and effected the liberty of the Russian Capt. Golownin and his associates.

10. In 1813, the Brig *Forrester*, Captain John Jennings, when in latitude 49° N., longitude 128° W., rescued the captain and two seaman from a dismasted junk, timber laden, when 18 months from Yeso, bound to Niphon. Thirty-five men were on board, of whom thirty-two died of hunger. They were delivered to the Russians, who undertook to return them to Japan.

11. Captain Alexander Adams, formerly pilot at Honolulu, relates that March 24, 1815, in latitude 32° 45′ N., longitude 126° 57′ W., when sailing master of brig *Forrester*, Captain Piggott, and cruising off Santa Barbara, California, he sighted at sunrise a Japanese junk drifting at the mercy of the winds and waves. Her rudder and masts were gone. Although blowing a gale, he boarded the junk, and found fourteen dead bodies in the hold, the captain, carpenter, and one seaman alone surviving; took them on board, where by careful nursing they were well in a few days. They were on a voyage from Osaka to Yedo, and were 17 months out, having been dismasted in consequence of losing their rudder.

12. In 1820, a junk was cast upon Point Adams, the southern shore of the mouth of Columbia river. The vessel, which was laden with wax, went to pieces, and the crew, many in number, landed safely.

13. A junk was wrecked on Queen Charlotte's Island, in 1831.

14. December 23, 1832, at mid-day, a junk in distress cast anchor near the harbor of Waialua, on the shores of Oahu. She was from a southern port of Japan, bound to Yedo with a cargo of fish; lost her rudder and was dismasted in a gale, since which she had drifted for eleven months. Five out of her crew of nine had died. December 30th, she started for Honolulu, but was stranded on a reef off Barber's Point on the evening of January 1, 1833. The four survivors were taken to Honolulu, where, after remaining eighteen months, they were forwarded to Kamschatka, whence they hoped to work their way south through the northern islands of the group into their own country. This junk was about 80 tons burden. According to the tra-

ditions of the islands, several such junks had been wrecked upon Hawaii, before the islands were discovered by Captain Cook.

15, 16. In 1833, a Japanese junk was wrecked on the coast of Washington Territory, in the immediate vicinity of Cape Flattery. Many of her crew had perished, and several dead bodies were found headed up in firkins, in customary Japanese style, ready for burial. Out of 17 persons, the only survivors, two men and a boy, were rescued from the Indians, by the Hudson Bay Company's vessel *Lama*, Captain McNeal, who took them to England, touching at Honolulu on their way. Thence they proceeded to Canton, where they arrived in 1836, and stopped with Karl Gutzlaff, who learned their language, and intended accompanying them to Japan. In 1837, they left Macao in the American brig *Morrison*, dispatched by Clarence A. King for Yedo bay, to bear them home. Being fired upon, July 27, and prevented from landing, she sailed for Kagosima, where, being equally unsuccessful, she finally returned with the men to Macao. The *Morrison*, on whom Samuel W. Williams and Dr. Peter Parker were passengers, also had on board four other Japanese seamen, rescued from a disabled Japanese junk, which had drifted a long time at sea, until finally stranded on the eastern shore of the Philippine Islands, whence the survivors were forwarded to Macao, to be returned to Japan.

17. In 1839, a wrecked junk was boarded by Captain Cathcart of the American whale ship *James Loper*, drifting in latitude 30° N., longitude 174° W., or about half way between Japan and the Hawaiian Islands.

18. In the *Polynesian*, October 17, 1840, published at Honolulu, I find: "The Japanese who took passage in the *Harlequin* remained at Kamschatka under the protection of the Governor awaiting an opportunity of returning to their native country."

NOTE.—In 1834, the brig *Harlequin* conveyed to Petropaulski from Honolulu 18 Japanese taken from wrecks, who had remained 18 months at Honolulu. They were finally returned to Japan by Russian officials.

In 1840, Mr. Nathaniel Savory, a native of Massachusetts, residing at Port Lloyd, Bonin Islands, reports a Japanese junk of about 40 tons, laden with dried fish, entered that harbor in distress, having been driven from her course along the coast of Japan through stress of weather, with her provisions exhausted. They repaired the damage to the junk during that winter, and she sailed in the spring for Japan. Had these islands been uninhabited, this case would have added another to the list of wrecks.

19. In 1841, a fishing junk from the southeast part of Niphon was wrecked on an uninhabited island, where the three survivors remained six months, until taken off by Captain Whitfield, master of the American whale ship *John Howland*, and brought to Honolulu, where Denzo and Goémon remained, while Nakahama Manjiro went to the United States, and was educated by Captain Whitfield. After being there several years he returned to Honolulu where he found his former companions, and embarked January, 1851, on the *Sarah Boyd*, Captain Whitmore, bound for Shanghai, taking with them a whale-boat called the *Adventure*, with a full rig and outfit. When off the Grand Liu-Kiu, the three Japanese effected a landing and the ship proceeded without stopping. Hence they finally reached Kiushiu and Nagasaki, in the

junk which bears the annual tribute money from Liu-Kiu to Japan. Manjiro afterwards translated Bowditch's Navigator into Japanese, and visited San Francisco as sailing-master of the Japanese steam corvette *Kanrin-maru*, which arrived there March 17th, 1860.

20. In 1845, the United States Frigate *St. Louis* took from Mexico to Ningpo, in China, three shipwreck Japanese, being survivors of the crew of a junk which had drifted from the coast of Japan, entirely across the Pacific Ocean, and finally stranded on the coast of Mexico, where they remained two years. The Chinese authorities were willing to receive these men and return them to their native country by their annual junk, which sails from Cheefoo to Nagasaki; but the Japanese objected to their landing, owing to the law of 1637.

In 1845, the Japanese authorities informed Sir Edward Belcher, commanding H.B.S. *Samarang*, that they would not receive returned Japanese from abroad, but "had sent a junk-full back to the Emperor of China," to whose country they had gone to obtain return passages by the annual junk permitted from Cheefoo to Nagasaki. The above leads to the inference that the *Samarang* may have had shipwrecked Japanese seamen on board.

21. In 1845, April 1st, Captain Mercator Cooper, of Sag Harbor, when in the American whale ship *Manhattan*, rescued eleven shipwrecked Japanese mariners from St. Peters, a small island lying a few degrees southeast of Niphon, and took them to Yedo Bay, where they were received under exception. Captain Cooper is also reported to have fallen in with a sinking junk, from which he rescued as many more Japanese seamen. [See Dr. C. F. Winslow's account in *Friend* of February 2d, 1846.]

22 In 1847, a French whaleship while cruising off Stapleton Island sighted a fire-signal on the shore, and sent a boat to the relief of five Japanese sailors, who were in a helpless plight; the only survivors of a crew, whose disabled junk lay stranded on the beach of a small bay. Later, about 1853, a party of officers from the U. S. steam frigate *Susquehanna* landed and surveyed this wreck, which they then described as "still partly kept together by large nails of copper, and portions of sheets of metal. Her planks, fastened together at the edge, were but little rubbed or decayed."

23. In 1847, April 21st, the Bremen ship *Otaheite*, Captain Weitung, when in lat. 35° N., long. 156° E., fell in with a Japanese junk in distress, which had lost her rudder and had been driven off the coast of Japan in a gale November, 1846, and had drifted five months. Took off the crew, consisting of nine men, also six tons of wax. She was about 80 tons burden and chiefly laden with paper belonging to Osaka, and bound north. Captain Weitung kept them on board four weeks, and May 19th, 1847, put them on board a junk in the Straits of Matsmai. [See *Polynesian*, October 17, 1847, and *Friend*, December 2, 1847.]

24. In 1848, Captain Cox of New London, Conn., picked up fifteen of twenty Japanese seamen from a disabled junk in lat. 40° N., long. 170° W., and kept them on board six months during a cruise in the Ochotsk sea, and finally landed them at Lahaina, where they remained six or eight months.

25. In 1850, during the autumn, S. Sentharo, Toro and J. Heco—the latter then aged 13 years—left Osaka in a junk for Yedo. After discharging and reloading they started to return via Woragawa. After leaving the latter

place their rudder was disabled and they lost their mast and drifted out to sea. Fifty days later the wreck was fallen in with by the American bark *Aukland*, Captain Jennings, who took off and brought the crew of 17 persons to San Francisco, in February, 1851. They were quartered on board the U. S. revenue cutter, and cared for by order of the Collector of the Port. Our citizens generally took much interest in them. The Japanese were subsequently embarked on the U. S. sloop *St. Mary's* and conveyed to Hongkong, where 15 were transferred to the U. S. steamer *Susquehanna* to await the arrival of Commodore Perry and his expedition. Heco and the second mate, Toro, returned to San Francisco on the bark *Sarah Hooper*, reaching there in the autumn of 1852. Seutharo returned with Rev. Mr. Goble, from San Francisco to Japan, and also Toro returned in the American bark *Melita* to Hakodaté from San Francisco, via Honolulu, April 19, 1859.

Toro was for a while clerk with Wells, Fargo & Co., and Joseph Heco, clerk with Macondray & Co. Heco was subsequently appointed for duty on the United States Surveying Schooner *Fennimore Cooper*, about 1858-59, and left her at Honolulu, on account of sickness, but finally returned to Yedo, on the United States steamer *Mississippi*. [See *Evening Bulletin*, June, 1862.]

26. In 1850, April 22d, in lat. 45° N. long. 155° E., the American whale ship *Henry Kneeland*, Clark, master, fell in with a Japanese junk having 13 persons on board. The vessel left Yedo for Kuno, but lost her rudder and was dismasted; then drifted to sea, and had been at the mercy of the winds and currents for sixty-six days, during forty of which they had subsisted on fish and snow water. The Captain and two seamen came to Honolulu on the *H. K.*; two of the crew were transferred to the *Marengo*; six were taken to Petropaulski and taken charge of by the Russian authorities, and two came to Honolulu by the *Nimrod*. [See *Friend*, October 15, 1850; also *Friend*, November 1, 1850.]

Note.—In 1851, by Japanese records I find that five Japanese seamen from Honolulu via China arrived at Nagasaki—probably the above.

27. In 1851, a Japanese junk was cast away upon Atka Island, and only three of the crew survived.

28. In 1852, April 15th, in lat. 31° N., long. 150° E., about 300 miles N. N. E. of Guam, Captain West, in the American whaleship *Isaac Howland*, fell in with a small Japanese junk in ballast. The four men on board had but a little oil to sustain life, and were much emaciated. Their tiller was lashed, and the vessel having been forty-nine days out of their reckoning, the crew had given themselves up to die. Two of these men Captain West took to the Atlantic States, and two were transferred to an American whaler about to cruise in the vicinity of the Japanese Islands.

29. In March, 1853, the American ship *John Gilpin*, Captain Doane, passed a water-logged wreck of a junk, her deck awash with the water, in lat. 18° —' N., long. 145° —' E., just beyond Pagan and Grigan Islands. Large numbers of fish were around the wreck. There were no survivors on board. She had every appearance of having been a very long time in the water.

30. In 1853, Captain C. M. Scammon discovered the wreck of a Japanese junk, on the southwest or largest of the San Bonito group of Islands, off

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Lower California, in lat. 28° N., long. 116° W., and near Cedros Island. [See *Alta*, April 22, 1860.]

Her planks were fastened together on the edges with spikes or bolts of a flat shape, with all of the head on one side. The seams were not quite straight, although the workmanship otherwise was good. That portion of the wreck in sight, was principally the bottom of the vessel, and gave evidence of having been a long time on shore. [Extract from Captain Scammon's log.]

31. In 1854, August 14th, just after Commodore Perry's departure, the American ship *Lady Pierce*, Captain Burrows, arrived at Simoda from San Francisco via Honolulu June 2, 1854. She returned Diyonoské to Japan, who was the sole survivor of a crew of fifteen men, and was picked off from a drifting junk near the Hawaiian Islands, after being seven months helpless at sea. He had resided some time in San Francisco.

32. In 1855, Captain Brooks, in American brig *Leverett*, which arrived her from Ayan, Siberia, November 29th, picked up an abandoned junk in lat. 42° N., long. 170° W., about 900 miles from the American Coast.

33. In 1856, the American bark *Messenger Bird*, Captain Homer, reported a disabled junk at Guam, Ladrone Islands.

34. In 1856, Captain Jno. C. Lawton, in the brig *Prince de Joinville*, while getting guano at Cedros and adjacent islands, reported a Japanese wreck, seen near Magdalena Bay.

35. In 1858, the U.S. surveying schooner *Fennimore Cooper*, Lieut. John M. Brooke, U.S.N. commanding, sailed from Honolulu for a cruise along the chain of islands extending thence towards Japan. He had on board a Japanese seaman named Marsa-Kitchi, whom he landed at Kanagawa. The junk from which this man was taken, was disabled at sea while engaged in the coasting trade, and her crew were forced to put her before the wind, heading to the eastward, a direction in which they were forced against their will. To drevent drifting too rapidly, they lowered their anchor in the open sea to act as a drag, paying out their full length of cable, and thus allowed it to remain until it finally parted.

36. In 1858, May 19th, the British ship *Caribean*, when in lat. 43° 40′ N., long. 171° E., about 1,600 miles from the coast of Japan, fell in with a dismasted junk, which had carried away her rudder, and had been about five months floating helplessly at sea. The captain, mate and ten seamen were rescued and brought to San Francisco, where they arrived June 7, 1858. They were cared for by Captain Winchester, who took them in the *Caribean* to Vancouver Island, whence he was bound for China, but having met a British war vessel off Japan, the rescued men were transferred to her, and thus landed at a Japanese port.

The junk was loaded with barley and rice, and barnacles two feet long were reported found upon the wreck.

The British Government presented £400 to Captain Winchester as a reward and in reimbursement of his necessary outlays.

37. In 1859, the bark *Gambia*, Captain Brooks, found the remains of a Japanese junk on Ocean Island, lat. 28° 24′ N., long. 178° 21′ W.

38, 39. In 1859, July 4th, the remains of two stranded junks, with lower masts high on the beach, were found on the east or lagoon side of Brooks Island, lat. 28° 11′ N. long. 177° 18′ to 25′ W.

40. May 11th, 1862, the bark *Yankee*, Captain Claxton, passed in lat. 25° 39′ N., long. 138° 24′ W., a wreck with the stump of one mast only standing, of which the wood was quite black with age. The junk was water-logged, and the sea washing entirely over her. Being satisfied there was no life upon her, and a heavy sea running, did not board; passed her three-quarters of a mile to windward, and the *Yankee* kept on her course.

41. In 1862, a Japanese junk was stranded in September near Attu. They had drifted in distress for 90 days, and out of a crew of twelve only three survived. These were taken in 1863 to Nicolaefsky, Amoor river, and then returned to Hakodaté by a Russian war vessel.

42. In 1862, May 4th, the ship *Victor*, Captain Crowell, arrived at San Francisco, with the captain, officers and crew, eleven in number, of the Japanese junk *Io-maru*, from Kanagawa, December 21, 1861, for Owari and Hiogo. On January 5, 1862, was disabled and drifted from land. Was about three months at the mercy of winds and currents, until picked up April 13th, 1862, in lat. 33° N., long. 161° 26′ E., by the *Victor*. They were cared for by Mr. Brooks, Japanese Consul, and by him returned to Japan, in the American schooner *Caroline E. Foote*, for Hakodaté.

43. A Japanese junk drifted past Baker's Island, lat. 0° 13′ N., long. 176° 22′ W., some time in 1863. Boats were sent out and towed it on to the beach. There were four Japanese bodies on board; all were dead.

44. In 1864, February 4th, on Providence Island, lat. 9° 52′ N., long. 160° 65′ E., on the Lagoon shore of the island was seen the portions of a vessel which had been many years a wreck. Scattered along the outer shore were many redwood logs, some of them of great size.

45. In April, 1869, an abandoned junk was stranded on Adakh, one of the Aleutian Isles.

46. In 1870, in October, the San Salvador ship *Louisa Canovera*, Captain Demoro, when in lat. 37° 46′ N., and long. 158° 10′ E., fell in with a dismasted junk, laden with rice, having four dead bodies on board, and no living persons. The papers and effects were taken and delivered to the Japanese Consul at San Francisco, and by him returned to Japan, November, 1870.

47, 48, 49. In July, 1871, the old chief at Attu Island, aged 70 years, reported that three Japanese junks had been lost upon the surrounding islets, during his recollection, besides one stranded not far from the harbor of that island in 1862.

50. In 1871, February 2d, in lat. 33° 45′ N., long. 141° 31′ E., about 150 miles from the coast of Japan, the American ship *Annie M. Smull*, Captain Packer, fell in with the Japanese junk *Sumi-yoshi-maru*, of Kiushiu, and rescued the Captain and three surviving seamen, and landed them at San Francisco, February 24, 1871. They sailed from Shiroko, province of Ise, January 17, 1871, for Dai Osaki, with a cargo of wood. Two days later they were disabled, and drifted to sea, and were picked up seventeen days later.

51. In 1871, May 23d, in lat. 34° 54′ N., long. 143° 32′ E., Pacific Mail steamship *China*, Captain Cobb, rescued five Japanese seamen from the disabled junk *Sumi-ayee-maru*, of Kobe. Eleven out of sixteen originally on

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board died upon the wreck, and the captain of the junk died on the steamer after being rescued. They were cared for by Mr. Brooks, who returned them to Yokohama, July 1, 1871, and the government presented suitable rewards.

52. In 1871, the Japanese junk *Jinko-maru*, of Matsaka, of 180 kokus measurement, encountered a severe gale January 18, 1871, while going from Isé to Kumano, during which she lost her rudder, and while in danger of foundering cut away her masts. The junk drifted from the coast of Japan in the Kuro Shiwo for 2,500 miles in a helpless condition, her crew keeping a fire and living on rice, and fish they speared, until they drifted on the rocks at Atka, July 10th, 1871, where, by means of ropes, the three men on board landed safely. There they remained until September 19th, 1871, when they took passage by schooner *H. M. Hutchinson* for Ounalaska and San Francisco, whence they were returned to Japan by the Consul.

53. In 1873, Captain W. B. Cobb, in steamer *China*, rescued the crew from a wrecked junk in lat. —°—′ N., long. —°—′ E., and landed them at Yokohama, in acknowledgment for which the usual present was made him by the Japanese government.

54. A junk has been reported as stranded on the coast of Alaska.

55. A junk was cast upon the windward side of Kauaii, one of the Hawaiian Islands, and the survivors landed at Hanalei harbor.

56. An old resident of Petropaulski informed me there was a Japanese junk stranded below that harbor, previous to 1812, where many years since the wreck still remained. Six of the crew survived.

57. A Japanese wreck was sighted adrift below San Diego. Reported in the *Alta*.

58. A junk was wrecked at Nootka Sound.

59. In 1875, April 6th, in lat. 38° 02′ N., long 164° 38′ E., American ship *Game Cock*, Capt. T. C. Stoddard, fell in with the Japanese junk *Woomohimaru*, of about 80 tons, dismasted, with her stern stove and rudder gone, and generally in a helpless condition, and rescued therefrom twelve Japanese seamen. The junk was bound from Hakodaté to Tokio, with a cargo of salt fish and sea-weed, when on December 3d they were blown off shore in a severe gale. December 10th they again made the land, when another heavy gale commenced and blew the junk off again. December 19th was forced to cut away the mast to save the hull. December 22d raised a jury mast and got under way, sailing towards Japan whenever the wind permitted; at other times took in sail and drifted. By their reckoning, they estimate having thus sailed 1500 miles west, principally with northeast winds, when, April 5th, in a bad sea, they carried away rudder, and soon after stove stern. At 8 A.M. the following day, they abandoned the wreck, from which they were rescued by the *Game Cock*, and landed at San Francisco April 28th, and were returned to Japan by Mr. Takaki May 1st, per *Great Republic*. For the rescue and kind treatment of these men, the Japanese Government presented Capt. Stoddard with a gold chronometer watch through His Excellency Yoshida Kiyonari, their Minister at Washington.

60. In 1876, July 3d, in lat. 37° 10′ N., long. 167° 35′ E., British barque *Abby Cowper*, Capt. Nelson, fell in with the Japanese junk *Koki-maru*, of Otaru, island of Yeso, of 477 kokus government measurement, equivalent to

about 120 tons. The junk was dismasted and floating in a helpless condition. Sakaki-bara Katsubé, mate, and Tomokitchi, sailor, the only survivors of 12 men, were rescued from the wreck, and made the following statement, which is very interesting as an illustration of many doubtless similar struggles. In October, 1875, the junk loaded at Shari and Abashiri, on the northern coast of the island of Yeso, with salted salmon and preserved roe of salmon. Left latter place November 5th, and touched at Hakodaté, whence they sailed December 6th for Tokio, Niphon. On the 9th, when on the east coast of Japan between lat. 39° and 40° N., and about long. 142° E., a severe westerly gale was encountered. December 12th carried away mainmast. Afterwards got it in and fished it with a piece of the main yard. On the 18th carried that mast away, and the yard was washed overboard. A sea soon after disabled the rudder, which was unshipped and taken in, the vessel in the meantime making water freely. To lighten her, 300 kokus of cargo (nearly two-thirds), was thrown overboard. From this time the vessel floated helplessly.

Early in January, 1876, fresh water gave out, and all the rainwater possible was saved and used. Then three seamen were taken down with the scurvy, which soon appeared among the balance. Towards the close of January, firewood gave out, but a small nucleus of fire was preserved in a stove. As a last resort, the junk's boat was broken up for firewood. All hands subsisting on a little rice cooked in rain water, and principally on salt fish, with a very small allowance of water. February 5th Chojero died—the first death. March 9th, Capt. Sato Sangoro died; then followed Kitsaburo, April 16th; Bunkichi, 21st; Kizo, 24th; Renkitchi, May 2d; Skedjero, 2d; Taské, 2d; Heihichi, 14th, and finally, Matsutaro, June 10th. The two survivors, anticipating a similar death, lingered until the forenoon of July 3d, when they sighted a vessel, had strength enough to raise a signal, and were rescued. They caught rain May 24th, after nearly all had died, which largely assisted in preserving the survivors. They also caught fifteen large fresh fish called *bonita*. Before the captain died, he wrote and handed to the mate letters to his family and owners, describing all details. The two survivors, expecting death themselves, boxed these up, with the ship's papers, and fastened them in a conspicuous place, whence they were taken and preserved. After the death of each person, the survivors enclosed their bodies in a Japanese coffin suitably inscribed, and stowed them in the hold of the junk, hoping they might reach some land and receive burial. The survivors reached San Francisco August 15th, 1876, and after recuperating, were returned to Japan by Mr. Takaki.*

Many more might easily be added, but these suffice to establish many facts valuable to science.

The annual rainfall of Japan averages 70.33 inches, occurring on 197.7 days, two-thirds of which falls between April and October; at Tokio the thermometer varies from a monthly maximum of 91° Faht. in August, to a minimum of 20° in January, averaging 58° 22 for the year, and averages 48° 33 at Hakodaté, where the average number of hard gales per annum is 16.79. [See Kaitakushi Reports and Tables, Tokio, 1875.]

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*—Note.—These last two cases have been submitted by Mr. Brooks as additions to the list for publication since the reading of this paper.

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The presence of wrecks so far south near the equator, indicates that they had been swept northward from Japan by the Kuro Shiwo, and thence southward along the northwest coast of America until they fell into the equatorial westerly current, where, in company with redwood logs, and drift-wood from Oregon, they must have reached these islands in the equatorial belt.

In illustration of this equatorial current, we have the report of residents of Christmas Island, which speaks of a westerly current setting past that island at the rate of one and a-half to two miles an hour. August 23d, 1861, there was picked up on the shore of the island of Niihau, in latitude 21° 50′ N., longitude 160° 15′ W., a bottle containing a paper, thrown from the American ship *White Swallow*, thrown overboard July 21st, 1861, in latitude 21° 30′ N., longitude 151° 55′ W. It had made a nearly due west drift of 460 miles in about thirty-three days. This shows the existence of a very powerful westerly current around the Hawaiian Islands of about 14 miles per diem.

In 1862, September 10th, an enormous Oregon tree about 150 feet in length and fully six feet in diameter above the butt, drifted past the island of Maui, Hawaiian Islands. The roots, which rose ten feet out of water, would span about 25 feet. Two branches rose perpendicularly 20 to 25 feet. Several tons of clayish earth were embedded among its roots. Many saw-logs and pieces of drift-wood came ashore in this vicinity about this time. These were evidently portions of the immense body of ship-timber launched upon the Pacific during the great flood of the previous winter along the American coast. Their almost simultaneous arrival at Maui in September, seems to indicate quite accurately the force and direction of the currents in this ocean. Supposing them to have come from the Columbia River, leaving say February 18th, 1862, and to have drifted 2,800 miles, they must have drifted at an average rate of 14 miles per day to have reached Maui September 10th.

We may argue from the above that there were other ways of explaining the similarity of flora upon many islands of the Pacific and the high terraces of our Sierra Nevada mountains, beside the hypothesis of an intervening continent where the broad Pacific now rests.

There is a strong presumption that the present bed of the Pacific Ocean may once have been an extended valley, submerged by some abrupt and spasmodic catastrophe, at a period when the fiery interior of the earth was in a state of inconceivable agitation, and its equilibrium temporarily disturbed. Abundant ruptures of the entire combined strata of its crust along our mountain ranges, bear indisputable evidence, in prominences tilted up and raised to immense heights: conditions which must have necessitated corresponding depressions, and consequently established new beds for water, forming new islands, re-dividing and re-shaping continents. The existing shore lines of enormous empty basins, the pebble and cobble stones rounded by erotion, at present in the centre of this continent west of the Rocky Mountains, all contribute testimony of some great change.

The spores or seeds of plants may, however, have been more recently transferred by clinging to the earth around the roots of such mammoth trees as floated from the high latitudes of the northwest coast of America. Once cast upon any island and rooted, they would soon replant and extend themselves. Driftwood from Columbia River and Puget Sound distributed itself throughout the North Pacific, and the windward shores of the Hawaiian Islands are literally lined with it, as well as with redwood logs of formidable size.

Small parties of male Japanese have repeatedly reached the American continent by sea, cast upon its shores after floating helplessly for months. Until recently, the survivors must have remained permanently near where they landed, and naturally uniting with women of the native races, have left descendents more or less impressed with their physical peculiarities. Such a slow, limited, but constant infusion of Japanese blood, almost entirely from male seamen, was undoubtedly sufficient to modify the original stock of all coast tribes along our north-western shore. No marks exist of any immigration *en masse*, neither is there any present record of any Japanese woman saved from such a wreck, although cases may formerly have occurred, but must have been very rare. These unfortunate seamen, often illiterate, and separated from their sources of learning, necessarily lost their own language; but in doing so, doubtless contributed many isolated words to the Indian dialects of this coast. Many shipwrecked Japanese have informed me that they were enabled to communicate with and understand the natives of Atka and Adakh Islands. Quite an infusion of Japanese words is found among some of the coast tribes of Oregon and California, either pure, as *tsche-tsche*, milk, or clipped, as *hiaku*, speed, found reduced to *hyack*, meaning fast, in Indian; or *yaku*, evil genius in Japanese, similarly reduced to *yak*, devil, by the Indians. In almost all words showing such similarity, the Indian word is always an abbreviated word, or shorter word than the Japanese, from which it may be argued that the latter was the original and the former derived. The construction of the two languages is, however, different. There are, however, a large number of pure Japanese words and some very peculiar Japanese "idioms, constructions, honorific, separative, and agglutinative particles" found nearly identical in the American-Indian dialect. Shipwrecked Japanese are invariably enabled to communicate understandingly with the coast Indians, although speaking quite a different language. The great mass of the Japanese people stoutly disclaim any common descent with the Chinese, and firmly believe they have a wholly different origin. Any common ancestor must certainly have been in very remote ages.

Professor George Davidson, in charge of the United States Coast Survey on the Pacific, our highest authority upon questions connected with the great ocean currents of this ocean, has bestowed much critical study upon the physical conditions connected with the Kuro Shiwo. In 1851, when stationed at the mouth of the Columbia river, he began the interesting investigations necessary to demonstrate its complete outline.

In 1868, he communicated to the National Academy of Science his deductions establishing the existence of the return current northwestward, westward and southwestward along the shores of the Gulf of Alaska, and the southern coast of the Aleutian Islands, whilst the great body of the current is deflected down the northward coast until it is drawn into the Great Equatorial Current which moves westward until it strikes the Asiatic barrier, and thence starts on its course, about the island of Formosa, as the great warm stream of Japan. He first showed the striking analogy between this stream and that of the

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North Atlantic, especially in their origin at latitude 23°, their being nearly 180 degrees of longitude apart, their general course, etc., etc.

There is a branch of the Kuro Shiwo, which shoots off northward near Kamschatka, and is felt 50 or 100 miles off this promontory; whilst close in shore, a cold current flows southward from the Arctic through the western part of Behring's Straits. On Kamschatka, the Kurile and Aleutian Islands, and on Alaska, great number of disabled Japanese junks must have been stranded in past centuries.

Professor Davidson, who has had occasion to examine the Spanish, English, Russian and American records of discoveries in this ocean, assures me that he has found mention of at least a dozen or more junks, wrecked on the coasts of Kamschatka, within a comparatively recent period; and in the earlier descriptions of the Kurile Islands, and of the Kamschatka Peninsula, he says frequent mention is made of the wrecks of Japanese junks upon these coasts.

Both winds and currents of the North Pacific assist in driving disabled Japanese junks around the great circle of the Kuro Shiwo. A junk disabled in the latitude of Tokio would be swept by alternate southwest and northwest winds, and the existing northeasterly current, towards the northwest coast of America. The distance from Cape King to San Francisco is about 4,500 nautical miles. We have here abundant proof of the track taken by these disabled vessels, by a study of their positions when found drifting at sea in the Pacific, at the mercy of winds and waves.

For many, many centuries the coasting trade of Japan has employed a large fleet of junks in exchanging rice from their southern, for salt fish from their northern ports. Although it may be presumed that the large number of their vessels thus disabled and rendered unmanageable, undoubtedly founder in the heavy gales they experience; yet comparatively large numbers having cargoes suitable for food, and crossing a region subject to much rain, which is easily caught, are enabled to sustain life until either picked up, or stranded somewhere on the American coast, or some island in their course.

In the above sixty cases enumerated, there were, from 1613 to 1694, four cases; from 1710 to 1782, three cases; 1804 to 1820, six cases; 1831 to 1848, eleven cases; and since the rapid settlement of this coast in 1850 to 1876, only 28 years, we have a list of 36 wrecks reported. This apparent increase is not owing to their increased number, but solely to the fact, that increase of commerce on the Pacific has distributed there a large fleet, whose presence has materially increased the chances of rescue to disabled vessels, and the likelihood of receiving reports from stranded wrecks.

In addition to the list we have enumerated, are the Hawaiian traditions that *several* such junks were wrecked on Hawaii before the year 1778; to which add the wrecks from which the 18 Japanese were returned from Honolulu in 1834, also those from which came the junk full of shipwreck Japanese, who attempted to, and failed in returning, by Cheefoo to Nagasaki; also the dozen additional ones, alluded to by Professor Davidson, as stranded on the peninsula of Kamschatka, within a comparatively recent period; and the frequent mention of similar wrecks on the Kurile Islands. These all taken together, with yet others not fully verified, could scarcely have been less than forty more, rendering it reasonable to suppose that fully one hundred wrecked Japanese junks, have been heard from, in one way or another, adrift upon the North Pacific, or stranded on the northwest coast of America or some outlying islands.

In answer to the question of whether any of these waifs have ever found their way back to Japan from the American coast, in early times, I can say, that from historical data still extant, and from the personal relations of descendants of some of such returned voyagers, I have learned that in rare cases, occurring from 400 to 260 years ago, crews actually reached Japan with tidings of the American coast; and Professor Davidson informs me, that when recently in Japan observing the Transit of Venus, a very intelligent Japanese scholar, well known to me personally, related to him a well authenticated case within this century. Formerly such accounts were not allowed general publicity, because stoutly discountenanced by an ecclesiastical government, to whom such discoveries were quite as repugnant as were Galileo's to the medieval government of Rome. To the peaceful masses, the confines of their archipelago, were but recently the horizon of the world.

The famous voyage of the Buddhist priest from China, at the beginning of the seventh century, to a country called by him Fusang, (meaning, translated "to aid or cultivating mulberries,") was at the exact period when Japanese historians record their first official intercourse with China; and was probably reached by a coasting voyage along the western coast of Corea, thence along the northern coast of Niphon, around Yeso, and southerly, to the southeastern shore of Niphon, where mulberry trees were then cultivated abundantly, and which was undoubtedly the land he called Fusang. A careful study of the native records seems to indicate that his much mooted Chinese voyage could not possibly have extended to the American coast.

Of the sixty cases here reported, 27 wrecks were encountered at sea, and the balance stranded, as follows: On the Aleutian Islands, 8; Coast of Kamschatka, 6; Alaska, Oregon, Hawaiian and Brooks Islands, two each; Off San Diego. Acapulco, Nootka Sound, San Bonito, Queen Charlotte, Cedros, Providence, Baker's, Stapleton, Ocean and Ladrone Islands, one each.

In 23 cases where the actual number on board was named, they aggregated 293 persons; an average of 12¾ persons to a junk; ranging from 3 to 35 in individual cases.

Where definite statistics of the saved are given. we find 222 persons saved in 33 cases; an average of 6¾ persons in each disaster. On eight occasions, three persons each were rescued; in four cases, one person; and on four other cases, four persons; three times, eleven were saved; and twice each, 5, 12, 15, 17; and once each 2, 6, 7, 9, 10, 13, were saved.

By an examination of the above figures, we may estimate the probable extent of Japanese blood infused into the Indian tribes around the shores of the North Pacific.

Fifteen vessels mention having drifted helplessly at sea an aggregate of 106½ months, averaging a little over seven months each.

Eleven cases report 122 deaths; averaging a little over eleven deaths to each wreck.

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It is sincerely hoped that the publication of this record, which has so interesting an ethnological import, may result in awakening Japan to the adoption of immediate steps in the great interest of a common humanity; for by improving the models of her vessels, and adopting those with sea-going qualities, this long record of disasters may speedily be abridged, if not wholly terminated.

About a year since it became my duty to forward to Japan, half a dozen wooden models, full drawings and specifications of small vessels, varying from 40 to 200 tons, ordered by the Japanese government for the use of shipbuilders, which the now enlightened government has recommended them to adopt, instead of their present form of junks. Thus the edict of 1639 has passed away forever, and young Japan is rising to take her equal place among the advancing nations of the world.

Few are better aware than the scientist, of the manifold and inevitable dangers which attend all radical changes, when suddenly made; for success is a problem seldom solved without repeated trials and inevitable failures. But to-day, Japan is earnestly seeking to establish her national perpetuity, by fostering a discriminating intelligence among her people, and by encouraging general and liberal education among the masses. Thus she reverses in the most practical manner, the other edict alluded to as promulgated in 1637. Her centuries of quiet seclusion are now embalmed with the history of the past, and she seeks true greatness, in an enlightened administration of her national affairs, and bids fair henceforth to reciprocate a generous friendship towards all members of the great brotherhood of nations, from whom she may now claim equal sympathy and neighborly protection.

The great changes in Japan can not be better illustrated than in the fact, that it is now customary for the government of Japan, in common with all other nations, to present through their Foreign office, some suitable reward in acknowledgement of kind service, to the captains of vessels who rescue their shipwrecked seamen.

The Japanese Government have now in their navy ten war ships, five dispatch vessels, and five training ships, all steamers; and in their mercantile marine, one hundred and two steamers of various tonnage, aggregating 30,718 tons; also 32 modern sailing vessels built in foreign style of 7,346 total tonnage.

The great Pacific Ocean and its adjoining waters, under the impulse of this age of steam, is becoming the highway of an enterprising commerce, and steadily unfolds an attractive field of research to ethnological and linguistic archœologists.

Many young Japanese are already attracted to scientific pursuits, and their valuable technical as well as general results, are beginning to claim the attention of naturalists.

Much valuable scientific work has been done by Japanese scholars since their early lessons received from Professor Wm. P. Blake and Professor Raphael Pumpelly; two eminent American scientists, whom I had the honor of selecting and engaging in the summer of 1861, on behalf of the government of Japan, to act as government Mineralogists and Mining Engineers.

A glorious opening now presents itself for some reliable and competent scholar, with pecuniary means at command, to collect a library of books relating to the Asiatic shores of the North Pacific ocean, as perfect in its way as is that of our great historian, Hubert H. Bancroft, relating to the native races of the American coast; and when as systematically classified, and as thoroughly studied, give to the world full and correct historical details and analytical classifications of all native races on the borders of Asia; many of whose records and traditions must necessarily fade with radical changes in civilization, and soon pass beyond human reach.

The splendid sunrise, now dawning in the Orient, offers golden opportunities, which should be promptly improved while available. Old ways are giving place to new, and invaluable treasures of antiquity, may be lost forever, or cast aside to linger for a generation or two, in the memories of the aged, before their shadowy forms become enshrouded in the misty veil of a forgotten past.

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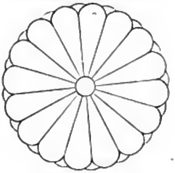
The National Arms of Japan.



(Chrysanthemum.)

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Washington 1896

THE YELLOW RACES.[1]

By Dr. E. T. HAMY.

Last year's course was mainly devoted to the study of that large group of peoples which are collectively known by the name of Yellow Races, although their color forms a chromatic scale, which at times is perceptibly removed from what is properly called yellow. This group of races, this main stem (trunk), to borrow a happy expression imported into science by M. de Quatrefages, is, numerically speaking, the most important of all those the great whole of which might be considered as the human forest. In fact, the number of yellow men could not, properly speaking, be estimated at less than 540,000,000: this is more than one-third of the whole number of mankind,[2] and I ought surely not curtail the study of so important a fraction of the human family, although I must acknowledge that the precise facts concerning the yellow races are as yet far from sufficient.

With a very few exceptions, our anatomical data are in fact only isolated documents. Our numerical observations, our special photographs, are few in number, and the conclusions drawn from the examination and the description of such indifferent materials must consequently be looked upon as eminently provisional only.

Such as I had formulated them quite recently, I have been compelled, after many fruitless efforts, to present them to you once more in this course of instruction, where one after the other, and in systematic order, each human group becomes the object of special inquiry, founded above all upon scientific investigation. And I have been very fortunate to find that, on the whole, my conclusions are not opposed by any opinion maintained elsewhere, and that, making full allowance for outward appearances, they still have nothing that could possibly shock the professional Orientalists, who are accustomed to use for the most ordinary purposes only linguistic characters.

The first observation which we have been called upon to make, as we enter into this subject, has reference to the relative antiquity of the

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[1] Opening lecture of the course on Anthropology, held at the Museum on March 23, 1895. Translated from L'Anthropologie, 1895, Tome VI, No. 3.

[2] H. Wagner and A. Supan estimate the population of the earth at about 1,480,000,000. (Die Bevölkerung der Erde. VIII, Gotha, 1891, 4to, p. xi.)

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yellow races in a widely extended area. There are indeed certain facts which justify us in supposing that one of these ancient, but now extinct races, knew the vanished mammalia of the valley of the Rhone, and that other old Mongolians lived in the east of Europe and in Upper Asia at a certainly less remote, but still very ancient epoch.

Restricted from the beginning to a rather septentrional habitat, the yellow peoples remained unknown to the ancient Egyptians until the time of the invasion of the Shepherd race, certain leaders of whom, depicted on the monuments of Sân or the Fayoum, bear truly Mongolian features. In Mesopotamia they may have furnished the elements of one of the two ethnical groups which in the dawn of history competed for preeminence under the names of *Accad* and *Sumer*. Accad, whose language is akin to the so-called *Turanian* idioms, ruled at Babylon, and displays on the few monuments on which its image is preserved very striking features.

The Mongolian features continue a process of exaggeration on certain more recent figures, where we see, as, for instance, at Behistun, among the prisoners of Darius, genuine Mongols with turned-up noses, delicate mustaches, high and prominent cheek bones, etc. Still other Mongolian faces are represented in the famous ruins of Sanchi (Malva), etc. We must, nevertheless, come down as far as Attila's invasion to collect some fragments of description, in which the Hun may appear with increased horror, owing to the fright with which he had filled the Christian world. Forma brevi, lato pectore, capite grandiori, minutis oculis, barba rara, simo naso, tetro colore, originis suæ signa restituens—thus writes Jordanes, describing Attila himself.

Many other historians, both Eastern and Western, have since that time depicted the immigrant hordes who passed through the breaches made by the Huns and opened for themselves a road to the very heart of the Empire: Avars, Chazars, Komans, and those Hungarians and Bulgarians, the fathers of the ogres of our legends, the bugaboos of popular speech. None of these portaits is more striking than that which is inserted by Mathieu Paris in his Grande Chronique. The clerk Yvon, of Narbonne, wrote from Neustadt, in 1243, to Girauld, archbishop of Bordeaux, to inform him of the devastations of the barbarians, and thus described these invaders, who became ever after known under the name of Tartars:

"Their breast," he says, "is solid and robust, *habent autem pectora dura et robusta;* their face is lean and pale, *facies macras et pallidas;* their shoulders are straight and high, *scapulas rigidas et erectas;* a short and turned-up nose, *nasos distortos et breves;* the chin is prominent and pointed, *menta prominentia et acuta;* the upper jaw is low and deep, *superiorem mandibulam humilem et profundam;* their teeth are long and few, *dentes longos et raros;* the eyelids hang from the eyebrows down to the nose, *palpebras a crinibus usque ad nasum protensas;* their eyes are mobile and black, *oculos inconstantes et nigros;* their look is a sideway and fierce look, *aspectus obliquos et torvos;* their extremities are all bone and nerve, *extremitates ossosas et nervosas;* finally, their thighs are big, but the legs short; in stature, however, they are our equals, for what may be wanting in the legs is made up in the upper part of the body, *crura quoque grossa, sed tibias breviores, statura tamen nobis æquales; quod enim in tibiis deficit id in superiore corpore compensatur.*"[1]

This portrait of the Tartar, drawn by Yvon, of Narbonne, is very remarkable in spite of its exaggerations and mistakes.

It shows, in fact, how the attention of the observer was at that time called to some of the principal features of that exceptional morphology which make of the true Mongol one of the fundamental anthropological types. From that time on Europeans, missionaries, merchants, etc., who shall approach the mysterious countries of the East will collect impressions less and less limited, less and less vague. And if in their reports they still continue to confound in one and the same great body races which have since been found to be infinitely varied, they will at least gradually establish a kind of general grouping, a first essay at coordination, which later on will lead to a rational classification.

Bernier is a fair representative of this phase of Asiatic studies in his famous letter, "On the different varieties of races of men," inserted in the Journal des Savants of 1684. "The third variety," he says, after having spoken of the whites and blacks, "the third variety comprehends a part of the kingdoms of Arakan and of Siam, of the islands of Sumatra and Borneo, the Philippines, Japan, the Kingdom of Pegu, Tonquin, China, Cochinchina, Tartary, which lies between China, the Ganges and Moscovia, Usbeg, Turkistan, Zaquetay, a part of Moscovia, the Little Tartars and the Turkomans, who live on the banks of the Euphrates toward Aleppo." "The inhabitants of all these countries," adds the illustrious traveler, "are really whites, but they have broad shoulders, flat faces, a small, crushed nose, small pig eyes, long and deep sunk, and three hairs for a beard."

This third variety of men of Bernier's is almost exactly the yellow trunk of modern anthropologists. The Americans alone are wanting, because Bernier with his imperfect knowledge of them did not see in them a sufficiently great difference to warrant making of them a special variety that would differ from ours. Mongols and Turks, Indo-Chinese, Japanese, and Malays are here all of them put into one and the same mold, which is to be broken up only much later by ethnologists, linguists, and anthropologists.

The names of Pallas, Castréro, Baër, and many others recall the vigorous efforts made for more than a century now to introduce a little order into Mongolic studies. The linguists insist upon it that we should not mix up in one and the same great whole people who speak monosyllabic languages and others who use the agglutinative system. The ethnologists also find it easy to show clearly the profound divergences which result from entirely different social systems, as from entirely different moral codes. The anthropologists finally claim the great importance of physical characteristics which are now studied for this purpose, with the aid of exact instruments, applied to living subjects as well as to skeletons. And from the coordination of all these combined studies there results a classification, which no doubt will yet have to undergo important changes, but which already, and however insufficient it may remain as yet, may give to instruction on this subject the frame work, so to say, which it needs, even though it be only provisional.

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[1] Mathæi Parisiensis, monachi Sancti Albani, Chronica major, edit, by R. Luard, Vol. IV, 1877, in 8vo.

It is no longer sufficient, in fact, as it was for Buffon, to compile the reports of travelers and to put them side by side in geographical order. Now, those descriptions which have become more accurate and more scientific must be presented in the most logical connection that is possible, and the characteristic features must appear subordinated in natural succession. It is only by applying these principles that we have succeeded in combining a classification which, before going any further, we deem it proper to present here in a summary arrangement.

Let us first of all recall the fact that we began by putting aside provisionally the American and the Malayan races, for a complete study of which this year's course will hardly suffice. Having thus gained more space for our purposes, we have set aside eight fairly kindred subjects, which are more or less voluminous, more or less ramified, which we will for the present mention by the names of Mongol, Turk, Indo-Mongol, Aleut, Tungus, Aino, Chinese, and Eskimauan.

The first is the properly so-called Mongolian branch, which has occasionally, by a mistake, given its name to the whole family, and which, on account of the exaggerations of all kinds that flourish concerning the subdivisions of which it consists, well deserves to occupy the first place at the head of our group. The word which designates it (Mongkou), and which means brave, bold, generous, is, however, the name of that fraction of the Chi-houéï to which Gengis Khan belonged, which sufficiently explains the part that such a name has played and still plays in the nomenclature of races.

The Mongolians constitute a mass of 2,000,000 to 3,000,000 souls almost all of whom dwell between Siberia and China, Manchuria and Turkestan; they are actually subdivived into Eastern Mongolians, the most numerous of whom, the Khalkas, are sometimes called Exterior Mongolians (the Interior Mongolians form the tribes Chakhan, Ourote, Ordo, etc.); Western Mongolians, called Kalmuks by the Turks, and subdivided into Songares or Tchoroses, Derbethes, Torgotes or Targontes, and Khochotes or Khochoontes of the Ala-Chan, and finally Bouriats, sometimes called Northeastern Mongolians.

To whichever group they may belong, these Mongolians are, as I have said before, the most marked of all yellow men; they exaggerate all their characteristic features to such a degree that in endeavoring to sketch the points that specially distinguish them, we have been able to form, as it were, a kind of large canvass, on which, afterwards, all our other Asiatic designs could be fitted, one after the other.

We have at the very first microscopically examined their hair, the most liotrichian that can be found, circular in form, at the same time very coarse, very black, very stiff, and very hard. We have analyzed the elements of that only slightly pigmented skin in its shades varying from citrine white to yellowish or reddish brown. We have next tried to explain to ourselves the morphology of those so-called bridled eyelids which are so characteristic of the race, and we have found, with Siebold, that they owe their peculiar aspect to a cutaneous fold which masks the corner of the eye until it makes the lacrymal caruncle invisible and covers the inner third of the tarsus cartilage, and to a thickening of the same cartilage under the upper eyelid, which covers and half hides the lashes. The opening of an eye thus "bridled" is curtailed, triangular, and often even oblique. We have found that these peculiar appearances of the Mongolian eye are independent of the facial skeleton, since there are in existence very many Asiatic subjects—I have exhibited several to you—in whom a nose of very great elevation and cheek bones very closely resembling our own may coexist with the most strikingly deformed eyes that could possibly be found in Mongolian countries.

The study of the skeleton has shown us that the Mongolian skull is hyperbrachycephalous; its cephalic index exceeds 87; it is a genuine Mongolian skull, which, for the present, represents the extreme limit of brachycephalism, free from deformity, with the index 98, 21 (Huxley). Shortened, enlarged, and at the same time elliptical, it is perceptibly less high than broad, and well deserves the name of platy brachycephalous, which I have recently bestowed upon it.[1] The face is in perfect harmony with this low skull, expanded transversely; it looks like a more or less shortened lozenge. The external orbital apophyses, long and divergent, form a connection with cheek bones of coarse nature, with angular cheeks pressed back on the outside by upper maxillaries of an exaggerated size. Turned down, forward and outward, these cheek bones, at the same time that they bend in a right angle upon their upper and inner edge so as to give to the orbit its remarkable breadth, overreach below in a characteristic projection on which Pruner-Bey has often very justly insisted. This is what he called the daylight orbit (orbite à jour); a part of the orbitary edge becomes really visible in the vertical direction. The Mongolian skull is, moreover, generally phænozygous; in other words, seen from above it shows its zygomatic arch more or less removed and convex. The maxillaries, which are transversely flattened, become rather hollow at a level with the canine cavities and afterwards develop largely, both transversely and upward. The nasal orifice, which they surround, is quite large, but at the same time very much elongated, and the indication which a comparison of these two dimensions gives is platyrrhinian. The bones of the nose, properly speaking, rise in a prominent ridge, and thus trace in the very center of the facial lozenge a quite characteristic relievo.

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[1] Crania Ethnica, p. 402 and foll.

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The dental arch is hardly prognathous, below the nasal aperture, to which it frequently adheres in an oblique slope which dispenses with the sharp edge of the prenasal vestibule. This arch is, however, large, short, almost semicircular, and is armed with teeth which present nothing remarkable, neither as to size nor as to shape.

The rather low, very powerful mandible is remarkable for the angular aspect of its symphysis, and of its posterior angles, which are prominent, often extroversated, and which extend on either side in a kind of voluminous heel.

To assist me in this description, I have placed before you some very striking specimens recently brought home from Mongolia by Dr. Ernest Martin, and by placing by the side of these skulls from Eul She Son Go, some Turkish, Annamite, Chinese skulls, and others, I have given you from the beginning of my demonstration a very precise impression of the large polymorphism of these races, which, though so varied among themselves, are habitually confounded in a veritable amalgam.

All the other characteristic features peculiar to the Mongolians have been examined with the same attention as the anatomical features. In this summary I shall not return to what I have told you at that time of their intellectual and moral nor of their social and religious peculiarities. Availing myself of the descriptions given by the best indorsed writers, I have endeavored to show you the most perfect picture of the life on the steppes, and certain photographs, with a visit to the Guimet Museum, have fortunately come to the assistance of my very unsatisfactory descriptions.

What I have thus done for the true Mongolians, I have next done for the Kalmuks, assisted by a good monograph by M. Deniker for the Bouriats, with the aid of divers documents collected by Messrs. Malieff and Bogdanoff, and we have thus been enabled to recognize how this last race of men, who of all Mongolians assimilated most easily, have in our day most essentially changed in consequence of their repeated alliances with their masters, our friends the Russians.

The second branch which we had to examine was that of the Old Turks, very much nearer to the source from which the Mongolians sprang than they have remained since, but one branch of whom, separated from the others by the great invasions toward the close of the Middle Ages, has in part preserved their archaic aspect. These Northern Turks are the Yakuts, permanently settled to the number of 200,000 souls, as this map shows, on the banks of the lower Lena, and they show us in several tribes, especially in those called Utsha, Cheta, etc., to judge by Middendorf's arguments, very striking Mongolian affinities.

The other Turks (perhaps 20,000,000 souls), those whom we call Turkomans in our works on history, and whose daring invasions into Europe and into Africa have wondrously enlarged their original domain, are much more mixed, and it is only from the countries whence they drew their historic origin that we can learn something of their character. With Baron de Bode and Colonel Duhousset we have visited them south of the Caspian Sea, under the name of Yamouds, Goklanes, etc., in the Caucasus under the name of Abreks, and we have been able to ascertain that the few practical observations made among these tribes coincide very exactly with those suggested by the Yakuts, their northern near relatives. In examining the skulls of the Turkomans, it becomes, however, necessary to bear in mind that certain of their tribes, and especially the Kurds and the Bakhtyaris have a peculiar custom; they deform the head by exaggerating the parieto-occipital flattening which is common to all Turks, a kind of natural curtailment, which almost constantly presses the top of the skull into a point behind.

This very habitual and very visible distinctive feature at once enables us to establish between the Turks and the Mongolians an immediately perceptible difference. There exists a second that is still more striking, and which, combined with the first, gives to the skull capsule of the Turk, whether he be a Yakut or a Turkoman, a cuboid aspect. This is the tendency of the head to develop upward, consequently just in the opposite sense to the vertical flattening of the Mongolian.

The Turk's head is, therefore, both taller and shorter; it is also a little less large in proportion, and the cephalic index is only subbrachycephalous. The face, adapting itself as is natural to the skull, which is thus slightly curtailed, is less open; on the other hand, the nasal skeleton is even more pronounced in the Turk than in the Mongolian, and you have been able to notice in some Ansariehs, for example, truly amazing instances of large noses.

Before leaving the Turkish branch, we had to examine long lines of types lying intermediate between the Turks and the Mongolians, such as the Uzbeks, the Kirghiz, the Bashkirs, the Nogaïs; between the Turks and the Finns, such as those extremely mixed subjects of the governments of eastern Russia, whom the reports of travelers erroneously designate without distinction as Tartars; finally, between the Turks and the Caucasians, the Slavs, the Greeks, even the Arabs, the Osmanlis of Constantinople, Kourouglis of Algiers, etc. We proceeded from one race to the other by insensible transitions, and we were thus able to appreciate the extreme difficulty which continually confronts us in separating scientifically the yellow men from the white men. We should meet with the same embarrassment if we went farther north in the course of similar inquiries. The lowlands of western Siberia are in the higher northern latitudes overrun by races like the Samoyedes, Kanirs, and others, among whom the individual varieties are really very extensive, and lead, almost without a break, from the Mongolian to the Lapp. Elsewhere in the same zones intermediate types produce other almost imperceptible transitions from the Lapp to the Finn, and from the Finn to the Slav. We are thus able to establish unbroken lines of observation between the most exaggerated of the yellow men and certain unmistakable white men. It is these transitional populations, if I may call them so, which Prichard, in his desire to designate them by a single collective name foreign to that great western body which he calls Indo-European, had proposed "for the present" to call Allophylian races. Thus he would have fused together, under a perfectly vague appellation, groups as thoroughly distinct, for example, as the Basque, the Finns, the Tschudes, the Ugrians, the Samoyedes, the Ostiaks, and all those East Siberians collectively known under the name of Paralians, etc., a kind of enormous rising en masse of the incerta sedis of the Old World ethnology. These Allophylians of Prichard, however provisionally only the famous author of the Physical History of Mankind may have wished to introduce them, have not yet entirely disappeared from the language of anthropology. Some special writers have retained them faithfully. It can, however, easily be seen that they are losing ground every day, and in some of last year's lectures you may have noticed that careful studies methodically pursued have perceptibly diminished the geographical area of populations which till then had been relegated into the *caput mortuum* of ethnological analysis, because they were not known at all or only very vaguely known.

But let us return to the series already classified, and having got rid of Mongolians and Turks, let us pass on to the races of the Himalaya, their southern and southeastern neighbors, grouped by Prichard under the name of Indo-Tartars, and whom, on account of their geographical position and of their affinities, we think it would be more proper to call Indo-Mongolians.

As far as scattered and incomplete observations will permit us to judge, these people are in almost every aspect intermediate between Turko-Mongolians and Indo-Chinese. In Tibet, where they call themselves Bhôt, they show themselves to be near akin to the Mongolians with their high cheek bones, "bridled" eyes, and straight noses, which are sometimes even convex, and in certain individuals sufficiently developed to remind us of the redskins of the prairies of the American Plains of the Great West. Their skull is subbrachycephalous. This type, very sharply marked on the high table-lands, gradually becomes less decided as we descend into the lowlands. The crossings which gradually absorb it, are, moreover, of a greatly mixed nature, borrowing here even from a more or less white race, and there from Dravidians or Kolarians. In Assam, especially, our Indo-Mongolians have contracted alliances with certain tribes of mountaineers, of whom we shall have to say more after the first lectures of this year's course—men who are very marked representatives of the Indonesian element, and who will furnish the subject of our first studies in the ethnology of the Malayan races.

In Indo-China, as at the foot of the Himalaya, there are here and there in the most elevated parts of the country small agglomerations of evidently Indonesian origin. There are here also, but in vastly larger numbers in Cambodia and the Tsiampa, descendants of ancient Hindoo immigrants. Finally, there exist, especially in the south, a few small tribes of Negritos.

All the remaining population, Birmans, Thaïs or Siamese, Annamites, is bound up with that of Upper Asia, of which we have spoken before, so that they all form a tolerably homogeneous totality, which approaches the Tibetan very nearly. This Indo-Chinese type, subbrachycephalous like the Tibetan, is subdivided into Burmah or Birman, Thaï, and Annamite. We have studied these three groups, one after the other, and we have followed their progress downward from the mountains to the deltas of the rivers, the basins of which they now occupy. A primitive, fairly homogeneous population, of which we shall have to speak again presently, at first occupied these lowlands; these people had, however, to give up the parts adjoining the great water courses to invaders of a different origin, who have gradually reached the south.

Some of these imported into the Eastern Peninsula elements of a civilization which was evidently borrowed from India. I have endeavored to present to you as complete a history of it as was possible, and we have studied together with the greatest carefulness the admirable monuments of their power and their art which they have left us in Cambodia and the Tsiampa. Others were those Burmans, those Thaïs, (Siamese, Laotians), those Annamites, whose fierce conflicts with Tsiampa and Cambodia we have followed from the beginning of this bloody quarrel to the French occupation, which has saved the last remnant of the Khmer people from utter destruction. I paid special attention to the study of those ethnical elements that are peculiar to the lands which we possess in the extreme East; and the examination of the characteristic features of all kinds, which are noticed among the former and the present inhabitants of the lowlands of the Me-Kong and the Song-Koi, has detained us a long time. I was specially interested in proving their perfect ethnical independence, as far as their northern neighbors, the Chinese, are concerned, although they were their masters long enough to impose upon them their mode of writing, their system of mandarins and many other things, but whose supremacy has never succeeded in altering, in any way whatever, the ethnical characteristics of their subjects. The Annamites, who have been thoroughly studied, as a race, in French Cochin China and Tonquin, have undergone no external modifications that could be ascribed to these intermarriages. To say the most, there have been found among the Tonquin people some taller and mesaticephalous people, a fact which has been ascribed to the intervention of Hôs, immigrants from China, who were taller in size and longer of skull. In the Eastern Peninsula, as everywhere else, the Chinese who marries a native woman finds that the offspring of this union, Minh-Huong, reproduces the features of the mother. At

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Saïgon, as at Batavia, Manila, etc., grandchildren retain next to no mark of their grandfathers.

In the pursuance of our investigations, and while getting gradually farther and farther away from the initial Mongolian type, we have examined in its minutest details the Indo-Chinese or Trans-Gangetic branch; then we have analyzed two other groups of races, of far less importance, and which, before my own researches, had never been thought of as constituting small ethnical groups of their own.

The first of these small branches, broken off, if we may say so, from Prichard's allophylous bush, comprehends the majority of the populations of the northeastern coasts from the Sea of Okhotsk to the peninsula of Alaska, Koriaks, Kamchadals, Chukluks, Chukchis on the shores of Asia, Aleuts, or Unnunguns in America, on the islands and at the point of the peninsula, which constitute this ethnical group of 25,000 men at best, imperfectly bounded no doubt, especially eastward, but existing beyond all doubt. It is interesting to ascertain that the geographical area of this group, which until now has had no name of its own, exceeds the size of the Continent of Asia and very evidently encroaches upon the New World. We shall later on meet with other similar facts, which, we are convinced, will not fail to throw a certain light upon the fact that the majority of the tribes of the New Continent owe their origin to Asiatic ancestors.

However this may be, we place systematically after the Tibetans and the Indo-Chinese, who are subbrachycephalous, the Chukluks whose average indication, 79.9, stands at the extreme limit of mesaticephally, and not far from them, the Tungus-Manchu (300,000 individuals), another breaking up of Prichard's "Allophylians," with their clearly mesaticephalous skull, which is at the same time excessively flattened. This is, I repeat, an entirely systematic process; we shall be justified in pursuing it, since it has enabled us to avail ourselves of the only characteristic features which are known with tolerable accuracy, the anatomical features. For they alone permit us, thanks to their clearly pronounced nature, to form a small, quite solid group, which may later on serve as a starting point for new efforts at classification. The whole of this remotest Siberia, the whole of this grand northern China, are territories overrun by small agglomerations of Nomads, which are usually only known by a few, rare photographs and a few tools seen here and there in collections. There are certain among them some who, according to Pruner-Bey's expression, establish a connection with the boreal American. The Ghiliak of the Trans-Amour appears thus like a kind of intermediary between the Tungus and Innuit or Eskimo.

This last group, which contains 27,000 to 28,000 individuals, constitutes an ethnical whole of its own, relatively quite homogeneous which once more presents to us the sight of a race having one end of its habitat in Asia, but having slowly reached, all along the bor ocean, the extreme northeastern part of the New World, Greenland, at the very time when it sent forth its most advanced tribes to reach the Falls of Niagara, though without going beyond them. I have here only briefly indicated the most essential features in the history of these Hyperboreans. It seemed to me more convenient to give you a detailed account of these various groups when I should present you the other natives of the far north of America. I do not, on that account, attach less importance to the ideas which I have always maintained as to the position which ought to be assigned to the Eskimos at one end of the line, of which the Mongolians occupy the other end. They are the true dolichocephalous members of Mongolism, as I shall show you in a few days. In the order of campaign which we have adopted they are separated from the Aleuts, with whom quite recently M. Virchow confounded them, by the Tungus-Manchu, whom we have just slightly reviewed, and by the Chinese, whom we shall yet have to investigate rapidly, so as to make an end of our studies as far as this whole great yellow host is concerned.

The Chinese, who are the most numerous of all yellow races (the least exaggerated numbers still give to China a population of more than 300,000,000), differ decidedly from all the other Asiatics whose essential features I have recalled before. Their hair, their complexion, their eyes, it is true, do not present any very decided peculiarity, but the bones of the skull and of the face offer forms and proportions which are not met with outside of what might be called the zone of Chinese influence.

Von Baër, who was the first to call attention to this special morphology of the Chinese head, expressed himself in a very picturesque manner when he tried to describe it. He had spoken of Buriat and Kalmuck skulls. "Imagine," he added, "you had the mold of a Kalmuck skull, made of some elastic material, such as gutta percha, and you were to compress with both hands the two sides of the top so as to make the brow rise and the top of the head and the occiput to stand out more boldly; compress then," he added, "the zygomatic arches so as to make them narrower and so as to cause the jugal bones, and especially the maxillaries, to appear in profile toward the front, and you will have the Chinese type."

The skull of the Chinese is, in fact, both longer and higher in proportion than those of all other yellow men. His cephalic index falls down to subdolichocephalism (the average indication of 142 skulls of the two sexes=77.24) and its height slightly exceeds its width. The face, harmonizing completely with the skull, is always of medium dilatation, with high and prominent cheek bones, and jaws which protrude in narrow and lengthened prognathism.

All true Chinese, whatever their origin may be, maintain more or less strictly the osteological type that I have here defined. No doubt the external features vary at times, vary very greatly, indeed; the

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complexion, for instance, which at the north is white with a tinge of citrine, may at Canton darken to a deep brown; the almost horizontal eye may change into one more or less oblique; the nose may become flatter or be raised higher; the face may change to one more ample and more massive; the figure, the corpulency may undergo serious changes. But beneath all these external variations the osteological type always continues most tenaciously, and the anthropologist may ascertain that the collections of heads preserved in France, in England, in Holland, or elsewhere, give the same measurements with unfailing constancy.

The morphological changes are, therefore, all on the surface, and the absolute uniformity of the skeleton is complemented by a corresponding identity of costume, manner of walking, etc. This vast nation, the first in the world in point of numbers, is almost entirely subject to common usages and identical manners. The queue, which the conquering Tartars compelled them to wear in the seventeenth century, dangles now on the back of all Celestials, and the long nails, protected by metal sheaths, are at the south as at the north symbols of idleness and wealth. On the other hand, the custom of deforming women's feet, so characteristic in central China, has never been adopted by Chinese women in the south, and the wives of Manchus, the princesses of the now reigning Imperial family especially, have feet like everyone else.

We have given very special attention to these various ethnographic peculiarities and we have left the Chinese only after having summed up as exactly as it could be done all that can aid us in improving our knowledge of this people, of their intellectual manifestations as well as of their physical appearance.

I have taken especial pains to trace the history of their legendary migrations, starting from the northwest, and to show you how the first occupants of the lowlands near the great streams of the east were driven back, step by step, toward the mountain regions of the south and southwest, where we shall meet them again under the name of Lolos, of Miao-tsé, etc., in our search for the cradle of the Indonesian tribes.

I have as yet said nothing of Korea, which was so long looked upon as a simple annex of China; nor of Japan, which ethnologists quite recently considered only another Cochin China.

The Koreans and the Japanese belong without contradiction, at least up to a certain point, to the great mass of peoples of the yellow race. The Koreans, whom I have shown you in photographs, used so greatly to resemble Tibetans, that they were often mistaken the one for the other; but there are others who make the impression as if they were the offspring of intermarriages, and more than one modern traveler unable to explain some national variations that might be called out o order, has brought in the most unexpected elements to account fo these strange mixtures, from the Aleutian (Chaillé-Long-Bey) to the Turk himself (Varat).

As to the Japanese, the immense anthropological collection (54 skeletons, 403 skulls, 27 pelves, etc.), sent to the Museum by M. Steenackers, shows the superabundant multiplicity of their various sources. It can hereafter no longer be doubted that the population of the Archipelago of the Rising Sun is connected by bonds of kinship with its neighbors on the Yellow Continent. But it is also becoming more and more certain, that some southern elements have played a very important part in their history as a nation. The Malays (to adopt a very general term), whose fleets ravaged the coasts of Tsiampa as late as the eighth century, had at times previous to that a powerful influence on the northern islands, and have left behind them numerous traces of their intervention. I shall take pleasure in seeing the ingenious and varied arguments brought to light by which M. Metchnikoff supports the very precise views which he has formed on that subject.

One last national element, which has remained very modest in its influence, because it was driven out with a kind of repugnance, by the Japanese, is the Aïno, the hairy race of Kuriles, of Sakhalin, and of Yeso. I have told you what little I knew of these singular islanders, whom for the moment I am utterly unable to classify. The Aïnos are, on an average, akin to the Chinese by their cephalic index, and I have provisionally placed them between the Chinese and the Eskimo, whilst most readily admitting that this classification is altogether provisional only.

Of the different branches of the yellow trunk, whose general physiognomy I have placed before you, those that could be gathered together in a tolerably homogeneous group without doing much mischief, have thus been passed in review. There remain to us to be studied a certain number of others, more or less irregular, and who, since Blumenbach, have been generally set apart under the names of the Malay branch and the American branch. This year's course of lectures will be devoted to the examination of documents of all kinds relating to these two branches.

We shall pass in review, successively, the material referring to the Korean and the Japanese races, considered in the light of intermediaries between those of the Asiatic Continent and those of the large islands which are dependent on them. Next we shall approach the facts which have reference to Malay land and its ethnological connections, Madagascar on one side, Polynesia and Micronesia on the other. This first series of studies will bring us to Easter. After vacation we shall begin the study of the races of the New World, which will occupy the whole remainder of the course.

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VARIOUS VIEWS AS TO THE ORIGIN OF THE JAPANESE PEOPLE.

The recent stride which Japan has taken in its social and political transformation, is to the rest of the world at once a miracle and a wonder. Indeed, our nation has accomplished in these last thirty years what other nations have taken at least three hundred years to accomplish. This stride, however, is not to be regarded as a miracle although it will remain a wonder. For such a stride cannot be a matter of chance—an effect without its proper cause. There must be reasons for it, and in fact there are such reasons, both external and internal. By the *internal* reason, I mean the old civilization which Japan has had for the last twenty-five centuries, and which served as a sort of preparation for the recent introduction of the new civilization from the West. If there had been no such preparation and yet such a stride in civilization as the recent one had been taken, we might then say it was a miracle. By the *external* reason, I mean that Japan, being open to the Western world at such a late date, had the opportunity of reaping all the good fruits of Western civilization, without the disadvantage of undergoing tedious, and often very expensive processes of experimentation. Thus in political institutions, in social reforms, in science, in art, in philosophy, in literature, and what not, we have the advantage of reaping, and reaping only. Others sowed for us. Our part is simply to gather the crop. We eat the bread, so to speak, which others have earned by the sweat of their brows.

The last thirty years of our national life are no doubt the most memorable epoch in the annals of our country, both in the past and in the future. Although thus what is often termed "New Japan" is only thirty years old, yet "New Japan' is not thereby new. According to our received chronology, which by the way, was adopted for the first time by an edict dated Dec. 15th, 1872, that is, only about twenty-five years ago, the accession of the first Emperor to the throne of the Japanese Empire took place in the year 660 before the Christian era; and from this accession the received chronology starts. Thus the current year is the 2577th year of the Japanese era. From this one can

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easily see how old "Old Japan" is. If for instance America is four hundred years old after its discovery by Columbus, Japan is more than six times older even after the accession of its first Emperor. That is to say, if America is a boy four years old, Japan is a young man at least twenty-five years old. This dates only *after* the accession of the first Emperor to the throne. We do not know just how long the Japanese, that is, our forefathers, had been in Japan, before this event took place. By the way, here is one remarkable fact which is worthy of remembrance, namely: Japan is the only country on the surface of this wide earth, where the emperors of one and the same dynasty have reigned, and are still reigning, for twenty-five centuries, so that the blood of the first Emperor is still circulating in the veins of the present Emperor, who is the 122nd successor to the former.

I remarked above, that we do not know how long our forefathers had been on the soil of Japan, before the accession of the first Emperor. You may ask, are not the Japanese the native people of Japan? In one sense the Japanese are certainly the native people of Japan, but they were not there always. They came from another country at what period we cannot tell. But we know that when our forefathers came to Japan, they did not find the country unoccupied. On the contrary, they found there the aborigines already occupying the land. These aborigines, at least most of them, were the ancestors of the race called *Ainu*, who live at present only in Hokkaidō, Yezo of former days, the most northern of the four main islands of the Empire, but who at that time seems to have lived almost all over the country. Our forefathers, that is, the ancestors of the present Japanese, came to Japan, and by the right of their stronger power and better civilization drove the aborigines away to the north and became the permanent occupants of the country; in a fashion similar to the conquest of the American Indians by the ancestors of the present white people there. *When* did our forefathers come to Japan? is a question which we cannot answer definitely at the present stage of our knowledge. But as to the question, *Where* did they come from? there have been many answers proposed. It is the purpose of this present article simply to enumerate these views, with some critical remarks where they are necessary and forth coming. Let us proceed to examine the most important views.

The first opinion we have to note is one held by the German scholar and physician, Dr. Kämpfer, who visited Japan towards the close of the 17th century, that is, about 200 years ago, and who wrote a history of Japan, which still claims the foremost place among all the works written by foreigners on Japan. According to his theory, our forefathers were at first the inhabitants of Babylon. When the confusion of tongues occurred at the Tower of Babel, the people there were obliged to scatter in all directions. According to Kämpfer, the Japanese were one of these scattered races, who made their journey from Babylon to Japan, spending several years probably, but stoping at no one place long enough, to lose the purity of their blood and language by intermixture with other people. Thus our author proceeds to tell the probable course which our forefathers took in their journey, around the foot of this monntain, along the course of that river, and so forth, as if he had been the actual witness, or one of the company. The chief ground on which Kämpfer founds his supposition is the purity of the Japanese language. Kämpfer was himself a great traveller. He travelled over Persia, Arabia, India, Java, and China,. But finally when he came to Japan, he was struck by the purity of the sounds of the Japanese, as strongly contrasted with the languages of all other countries he travelled over. Hence he concludes thus: "The Japanese language is one of those which sacred writ mentions, that the all-wise Providence thought fit to infuse into the minds of the vain builders of the Babylonian Tower."

An equally striking and at least in appearance more scientific theory is that propounded by Hyde Clarke, who traces the origin of the Japanese people to an ancient Turano-African empire. According to this view, "the Akkad-Babylonians, the Egyptians, the Lydians, the Etruscans, the founders of the Chinese and Japanese Empires, and also of the North American mounds and monuments, and of the civilization of Mexico and Peru," all belong to a Turanian white race, whose original home was in High Africa, "a white race earlier in the field of history than the Aryans." These Turano-Africans conquered Central Africa first. They then proceeded to Egypt, to Greece, to Babylonia, to India, to China, and finally to Japan. On the other hand, another branch proceeded in the opposite direction to the two Continents of America. When these white Turano-Africans came to Japan,

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they found the land occupied by the short races. They intermarried with the native women, according to Clarke. "This," says he, "would produce a mixed race, differing again from the races of shorter aborigines; thus the new dominating Japanese race would maintain and propogate their dialect of the language and their own religion, and, being in more favorable conditions, would displace the pure natives." Here again the chief ground is linguistic, as our author himself declares, "the first real step made by me, was the discovery of relations between the languages of the Japanese people and the Ashantee and others of western Africa."

There is another theory which perhaps is just as far-fetched as the last, and which tries to trace the original home of the Japanese to Palestine, making them identical with some of the "ten lost tribes of Israel." This theory is interesting, not so much in itself, as in the fact that it emphasizes some of the striking features and customs of the Japanese. The Japanese of all ages have a curious and at the same time remarkable hatred of physical uncleanliness. They cannot stand filthiness. They have almost an instinctive love of purity and neatness. In this respect, they are strikingly in contrast with all the unclean neighboring races, such as the Chinese, the Koreans, and the Ainus. This praiseworthy habit no doubt has much to do with the old religion of the Japanese Shintōism. Another characteristic of this religion is the absence of any tendency towards idolatry. Besides these, there are more points of analogy between them. If the reader studies the construction and dependencies of a Shintō temple, the rites of purfication, the laws of the clean and unclean, the system of *taboo*, and so forth; in fact, if the reader studies the minute details of the religious life of the early Japanese, he will find out that the religion of the Japanese has so much in common with the religion of the Old Testament, that the conclusion as to the Jewish origin of the Japanese is not altogether groundless, especially in the absence of any settled opinion as to their derivation. However the difficulties of this hypothesis are so numerous, and conspicuons that it is hardly necessary to enter into their consideration here.

Still another opinion traces the origin of the Japanese to the Malay peninsula and archipelago. Of this theory, J. J. Rein, whose history of Japan is so far the best of the kind, says as follows: "It has been suggested as a possibility that the first Japanese who landed in southern Kyûshû were probably Malays, who had been driven out of their course, and having come within the influence of the Kuro-shiwo [the Black Current], had been carried by it to the coasts of the Japanese islands. Docuitz, who shares this view, thinks he finds in the facial expression of the Japanese, in the construction of their houses, which remind him of the pile dwellings of the Malays, and in the arrangement of their latrines, evidences of their Malay orign. "The main difficulty of this supposition lies in the difference of the languages of these two peoples. Of this again Rein says, "The Japanese language has no relationship with Malay and Polynesian, either in structure or vocabulary. It is polysyllabic and places the verb at the end of the sentence in the same way that Cæsar is especially fond of doing; while in the Malay family of languages, as in Chinese, the verb must precede the object which it governs. In Japanese the adjective does not follow the substantive as among the Malays, and South Sea Islanders, nor the genitive the nominative, but precedes it. In the same way many other radical distinctions might be pointed out, which prove that, even philologically, no such Malay influence, and therefore no such immigration as that supposed, can be recognized."

Dr. Griffis is of opinion, at least as expressed in his "Mikado's Empire," that "the mass of the Japanese people of to-day are substantially of Ainu stock." As to the difference between the Ainu and the Japanese, he explains thus: "An infusion of foreign blood, the long effects of the daily hot baths and the warm climate of Southern Japan, of Chinese civilization, of agricultural instead of the hunter's method of life, have wrought the change between the Ainu and the Japanese." This is not altogether beyond possibility, and to some extent may be true. However, when he says, "Ainus and Japanese have little difficulty in learning to speak the language of each," one is apt to get a wrong impression. Probably both languages belong to the same family or stock; but from this, one must not conclude that the Ainus and the Japanese can understand each other's language without some previous study or preparation. Perhaps the difficulty in learning each other's language may be *small*, but this *small* is merely comparative in its meaning and does not tell just how much. The study of German is easier to an Englishman than to a Japanese, and hence the difficulty is smaller to the former than to the latter. Again when Dr. Griffis concludes that, "It seems equally certain that almost all that the Japanese possess which is not of Chinese, Korean, or Tartar origin, has *descended* from the Ainu, or has been *developed* or *improved* from an Ainu model," we cannot see much sense in this remark. We might as well say: What the white inhabitants of America did not derive from their old European homes, must have descended from the American Indians. This is self-evident, and does not tell anything as to the relative proportion of the two elements. No one can infer from this, that therefore the white inhabitants of America must be substantially o Indian stock. The Ainu and the Japanese are so strikingly different, both in their physical features, and in their intellectual capacities, as we know from the stubborn facts, that one fails to accept this doctrine of Dr. Griffis, who, by the way, I am told, has changed his opinion about this matter.

Are the Chinese and the Japanese of the same stock or race? The answer in the affirmative is a very natural conclusion to those who do not know much about the history and languages of these two peoples, especially because the Chinese and the Japanese are very similar in their appearance. Indeed they do resemble much in their physical features, as is shown by my own personal experience of taking a Chinese for a Japanese. The man was dressed in the Western fashion and he spoke to me in English. I thought it strange for him not to speak in his native language, that is, Japanese. But afterwards, to my surprise, I made the discovery that he was really a Chinese. Such may be the case now and then, but that by no means proves that the Japanese people as a whole is not physically distinguishable from the people of China. If one studies the two peoples carefully, he will soon be able to find out the distinctive features by which they can be physically distinguished. Moreover, those who are familiar with their history and language would never assert that the Japanese were once the Chinese, or that they originally belonged to one and the same race. The principal ground for the distinct origin of these two peoples is to be found in the difference of the languages of the two countries. The one is monosyllabic, and the other is polysyllabic. The one has the verb before, and the other after its object. The two languages are also different, as to the number and nature of their sounds. The

Japanese hate consonants pronounced together without intervening vowels, as well as consonantal endings; while nothing is more common than these in Chinese. Some sounds which are found in Chinese are wanting in Japanese, and *vice versa*. For example, Chinese, at least the Chinese of to-day, has no *r* sound, while Japanese has no sound of *l*. Thus, while the Chinese say *lice* for the English *rice*, the Japanese pronounce *light*, *right*.

In language as well as in many other respects, the Japanese are more like the Koreans, especially the early Koreans. Here probably we may find a more probable explanation of the origin of the Japanese people. J. J. Rein is of this opinion, and in fact most of the scholars seem gradually to tend towards this theory. But when I say the Koreans and the Japanese were originally of one and the same stock, I do not mean that the Coreans were once our forefathers, neither do I mean that the original home of our forefathers was in Korea. What I mean is that these two peoples originally came out of the same stock of people. Where this original stock lived, no one knows. J. J. Rein expresses his opinion thus: "According to Chinese annals there came about 1200 B. C. Tartar tribes to Corea, and settled partly here, partly in the eastern islands. If then the facial type and hair of the Japanese is Mongolian and not Malayan the language points beyond Korea, to the Tartaro-Mongolian stock in Central Asia; and if finally, the position of the country and ancient traditions easily admit of their being brought into harmony with the story told by the Chinese, the possibility appears very great, that the immigrant Japanese were in fact members of that great Altaic family of peoples which was once dispersed in all directions from its primitive home, and distributed itself all over Asia, from the Pacific to Pontus and the Mediterranean."

Thus far I have enumerated some of the most important opinions as to the origin of our forefathers. If more are required they can be given, but probably the reader has had enough already. The possibility of the existence of such divergent views, demonstrates that no one is certain as to the origin of the Japanese. We Japanese do not know ourselves just where our ancesters came from. There is the Japanese tradition among us that the heavenly deities commanded the two deities Izanagi, the Male-who-Invites, and Izanami, the Female-who-Invites, to *descend from heaven* and to give birth to Japan,

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and that they came down from heaven, and created the eight great islands of which Japan consists, and also became the ancestors of all human beings, that is, of Japan. But we do not know just where and how we got this tradition; neither do we know where this heaven was and when the deities came down. In my opinion the last one of the views enumerated above seems to be most free from difficulties, and most concordant with the facts as far as I know them. But even here, if one fails to look "*beyond Korea*" for the origin of the Japanese peope, we surely make a great mistake. We must always remember that "The Japanese people undoubtedly deviate so considerably in physical conformation, language and customs from the neighboring peoples, that only an *indirect affinity* with them appears possible, and no direct derivation from them admissible;" and that the strongest basis on which this indirect derivation is founded is in the nature of the Japanese language, concerning which the scholars are generally agreed that it belongs to the Turanian or Tartar or Altaic family, among whose peculiarities we find, first, that it is agglutinative, and, second, that the verb comes after the object which it governs. But when I say, that the Japanese and the Koreans must have belonged to one and the same stock, I must not be understood as if to mean that the present people of Japan are wholly of this single stock. By no means. The present people of Japan are a sort of conglomerate of different types of human beings. Here you meet men of the Malay type, then of the Chinese type, and then you see men of the American Indian type. Morever, occasionally you discover some of the Negro type as well as men of the Caucasian type. I am not speaking of the present people of Japan, but I am speaking of that dominant race of people only, that conquered Japan and laid the foundation of the Japanese Empire.

Wherever the original home of this victorious people might have been, when we find them at the dawn of our history, we find them occupying almost all the south western half of Japan. How thickly the country was inhabited we do not know; but according to our earliest historical records, and also from the actual existence of many traditional sites, there seem to have existed at least the three distinct groups of their settlements. The most eastern group we may call *Yamato*-group, and its centre must have been in or about the province which is now known by that name. This province is not far from Kyōto, and is still full of famous traditional sites. The second group we may call the *Izumo*-group, and it also must have had its centre in or about the present province of the same name. This province has even now one of the oldest and most important Shintō temples, and is the centre of the *Izumo*-group of traditional legends. This second group comes almost half way between the first and the third group, that is, west of the first and east of the third. The third group must have been somewhere in the southern part of the Island of Kyūshū, the most western of the four main islands of the Empire. This we may call the *Tsukushi*-group, and the regions covered by the traditions belonging to this group are still full of old traditional sites. Now, we are pretty certain that there were at least these three groups of the settlements of our forefathers, if not more. Of course, we do not know how long they had been there before they came to be unified; neither are we sure that they were of one and the same stock. But in all probability they must have been of one blood and one language, and also it is quite likely that these three groups represent three successive waves of immigration. The *Yamato*-group was probably the oldest, and originally occupied the region where the *Tsukushi*-group finally settled. But when the next wave, which is known as the *Izumo*-group, reached Japan, the *Yamato*-group was driven north-eastward by these new-comers. When at last, the third wave came and settled in the southern part of the Kyūshū-Island, they drove the *Izumo*-group from thence, to the region where we find them in history; while this group in its turn pushed the *Yamato*-group eastward to its last home, where we find them at the beginning of our history. Such seems to me to have been the way in which the successive settlements and the resulting migrations of the early Japanese took place.

Now the question is, How were these groups unified? From the old traditions, which are of course a mixture of mythological legends and historical facts, we can gather the threads of truth to the effect, that the *Tsukushi*-group, the last and newest of the three waves of the immigrants, started from their home in the Island of Kyūshū and began the conquest of all the regions occupied by the *Izumo* and *Yamato*-groups. Why they began such a movement, we do not know, but perhaps another, if so, the fourth, wave of migration reached Japan from the Continent of Asia and necessitated them to proceed eastward. What-

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ever be the cause of their movement, they left their home and advanced to conquer the rest of Japan, and they were successful in this conquest. They subjected the *Izumo*-group, and then proceeding still north-eastward subjected the *Yamato*-group, and thus they became the ruling people of the land. Of course, this took some time, but at last through the conquest of their brother tribes and all other tribes then living in the land, some sort of the *unification* of all the then known Japan seems to have been accomplished. It was the leader of this conquering tribe that became the first Emperor of Japan.

Here many questions may suggest themselves to the mind of the reader. For example. How civilized were these intruding conquerers, that is, the early Japanese? Were they savage or tolerably well civilized? Were they much superior to the aboriginal tribes whom they subjugated? When does the authentic history of Japan really begin? How far do our traditions carry us back? Did these conquerers advance much in their civilization, during the period between their conquest of Japan and our discovery of them in history? When did Chinese civilization begin to assert its influence over the thought and life of the early Japanese? Can we ascertain the social and religious life of the early Japanese before they came under the influence of Chinese civilization? How was their social and religious life, as compared with that of the modern Japanese? What were their distinctive characteristics and peculiar features? It would be very instructive as well as interesting to fully discuss these qnestion but that is altogether outside the scope of the present paper. Here we must satisfy ourselves with a mere glance at the various views as to the origin of the Japanese people.

NOBUTA KISHIMOTO.

[Mr. Kishimoto, B.D., M.A., is a teacher of the Higher Normal School and the editor of the *Shūkyō*, a religious magazine.]

From Far East Oct. 20 1897

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EVIDENCES

OF

CANNIBALISM

IN AN

EARLY RACE IN JAPAN.

BY

EDWARD S. MORSE.

[REPRINTED FROM THE "TOKIO TIMES," JANUARY 18TH, 1879.]

TOKIO, JAPAN.
1879.

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BIOLOGICAL SOCIETY OF THE TOKIO DAI GAKU.

At a meeting of this society, held on Sunday, January 5th, Professor E. S. Morse communicated some facts regarding the human bones found at Omori. We present an abstract of his remarks on the occasion.

One of the most interesting discoveries connected with the Omori mound is the evidence of cannibalism which it affords, this being the first indication of a race of anthropophagi in Japan. The human bones were found mixed with bones of the wild boar, deer and other animals. They were all fractured in a similar manner, either with the object of extracting the marrow or for convenience of cooking in vessels of too small dimensions to admit them at length. When discovered, they were entirely unrelated to each other. Some hopes were entertained that the place might have been used for purposes of burial, and special search was made for a continuous series of bones; but no proof was obtained in support of this supposition, and this is in accordance with the experience of those who have examined similar deposits in other parts of the world. The bones were mixed indiscriminately with other remains of feasts. Some of them are strongly marked with scratches and cuts, especially in those areas of muscular attachment where the muscles are separated from the bones with difficulty. The very mode of fracture in some cases is conspicuously artificial, and the surfaces for the attachment of muscles are strongly incised. These testimonials of cannibalism are of precisely the same nature as those educed by Professor Wyman in his memoir on the shell mounds of Florida. The accompanying passage is extracted from that memoir, page 68.

> The reasons derived from our own observations for believing that the ancient inhabitants of the St. John's were cannibals may be stated as follows:
>
> 1.—The bones, an account of which we have given, were not deposited in the shell heap at an ordinary burial of a dead body. In this case, after the decay of the flesh, there would have remained a certain order in the position of the parts of the skeleton, especially in the pelvis, the long bones of the limbs, the vertebral column and the head. The bones would be entire, as in other burials. In the cases here described, they were, on the contrary, scattered in a disorderly manner, broken into many fragments, and often some important portions were missing, as the head, at one of the mounds near Blue Spring, the bones of an arm and leg at another, and in other mounds a still larger number of bones. The fractures, as well as the disorder in which the bones were found, evidently existed at the time they were covered up, as is shown by the condition of the broken ends, which had the same discoloration as the natural surfaces.
>
> 2.—The bones were broken, as in the case of those of edible animals, as the deer, alligator, etc. This would be necessary to reduce the parts to a size corresponding with the vessels in which they were cooked, or suitable for roasting, or even for eating raw.
>
> 3.—The breaking up of the bones had a certain amount of method; the heads of the humerus and femur were detached, as if to avoid the trouble, or from ignorance as to the way of disarticulating the joints. The shafts of these bones, as also those of the fore arm and leg, were regularly broken through the middle. The olecranon process of the ulna was in some cases detached in the same manner as the corresponding part of the deer.

Had this description referred especially to the Omori mound, there could not have been a more perfect accordance with the facts as they stand.

The evidence of cannibalism in the New England and

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Florida heaps was to have been expected, as history shows us that many tribes of North American Indians were eaters of human flesh, and tribes exist to-day, both in North and South America, who retain the habit. The evidence of cannibalism in Japan, however, has a different significance, because the minute and painstaking chronicles of their historians, running back with considerable accuracy for fifteen hundred years or more, give no trace of so monstrous a practice. Not only were the Japanese not cannibals, but there is no account of the tribes they encountered being addicted to tastes of this character, and so remarkable a trait would have found some acknowledgment in their records. The early historians speak of the Ainos as being of so mild and gentle a disposition that the art of murder was unknown among them. [For these details, Mr. Morse stated his indebtedness to Their Excellencies Messrs. Tanaka, Kanda, Kato and other Japanese scholars.] The failure of an adequate supply of food invariably drives even the highest of civilized races to this extremity, but no such necessity forced the people of the Omori period to so shocking an alternative. In this connection it would be interesting to know whether there are any records of the Japanese having been compelled by great exigency to subsist upon human flesh. There are many accounts of drifting Japanese junks given by Mr. Charles Walcott Brooks in the proceedings of the California Academy of Sciences. In these instances the survivors had prepared for burial those of their number who had perished from exposure and starvation.

The following is a list of the human bones thus far met with in the Omori mound:—

Right humerus; length of fragment, 195 mm.; proximal end gone.
Left humerus; length of fragment, 215 mm.; both ends gone.
Left humerus; length of fragment, 160 mm.; both ends gone.
Right ulna; length of fragment, 200 mm.; distal end gone.
Right ulna; length of fragment, 180 mm.; both ends gone.

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Right radius; length of fragment, 80 mm.; upper portion only.

Right femur; length of fragment, 150 mm.; proximal end and portion of shaft only.

Right femur; length of fragment, 270 mm.; both ends gone.

Right femur; length of fragment, 280 mm.; both ends gone.

Right femur; length of fragment, 107 mm.; upper portion of shaft.

Right femur; length of fragment, 304 mm.; articular surfaces broken; child.

Left femur; length of fragment, 160 mm.; shaft only.

Left femur; length of fragment, 270 mm.; great trochanter and head and distal end gone; child.

Left femur; length of fragment, 85 mm.; lower portion only; articular surface gone; child.

Right tibia; length of fragment, 185 mm.; upper portion of shaft.

Right fibula; length of fragment, 205 mm.; both ends broken.

Fifth right metatarsal; length, 65 mm.; distal articular surface partially gone.

Left lower maxillary.

Left parietal.

Of sixteen long bones of the arm and leg, nine are destitute of both extremities; and of the remaining seven, three are destitute of the lower extremity, two of the upper extremity, and in two, the articular surfaces of both ends are gone. Nothing more clearly illustrates the indiscriminate way in which the bones were scattered about, than the fact that the eight femora found represented at least seven different individuals, four being adults and three either women or children. None of the human bones show marks of having been wrought, but this we should not expect, since most of the implements discovered are made of horn. Only a portion of the shaft of a tibia was met with, though special search was made, in the hope of securing a number, as great interest attaches to the tibiæ of early man on account of the lateral flattening which so frequently occurs, and to which the name platycnemic tibia has been given. From the wide variation this bone presents in man, the single example here mentioned can have but little significance. It may be of interest, however, to give its proportionate measurements in contrast with corresponding measurements given by Wyman in his Florida mounds memoir.

The antero-posterior diameter being taken as 100, the transverse diameter in

Twelve, white race (recent), was 0.74;
Twelve, from the Florida mounds, 0.64;
Seven, from the Kentucky mounds, 0.68;
One, from the Omori mound, 0.62.

There were others from the Florida mounds as low as 0.59, and Mr. Gillman discovered one in a mound on Rouge river, Michigan, with the excessive lateral flattening of 0.53. This latter tibia far exceeds the famous Cro Magnon tibia of Broca, which gave an index of 0.60. The Omori specimen, with its index of 0.62, may be looked upon as a fair platycnemic tibia. It has a remarkable lateral flattening in contrast with nine recent Japanese tibia, which were measured at random and which gave an index of 0.74;—the lowest index in the lot being 68.4.

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ATIC SOCIETY OF JAPAN (TRANSACTIONS)
l. 8, part 3, Tokyo, 1907

I.

PLATES TO ILLUSTRATE

MR. SATOW'S PAPER

ON

ANCIENT SEPULCHRAL MOUNDS

IN

KAUDZUKE.

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TRANSACTIONS

OF

THE ASIATIC SOCIETY OF JAPAN.

ILLUSRATIONS & WOODCUTS

TO ACCOMPANY

VOL. VIII: PART III.

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TOKYO:
1907
AT THE SOCIETY'S ROOMS.

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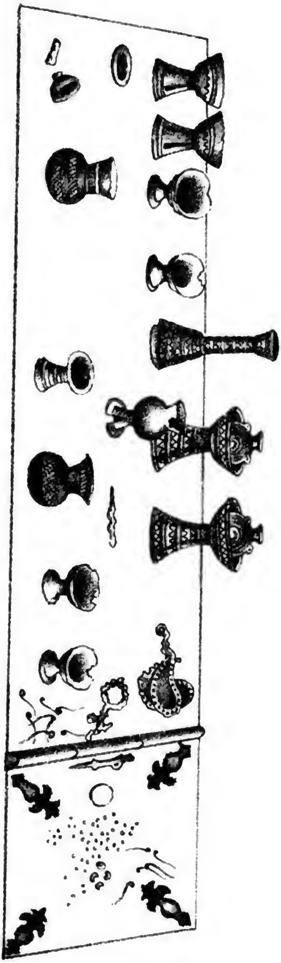

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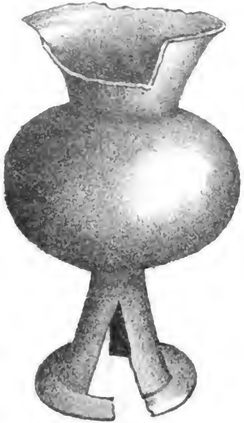


FIG. 1

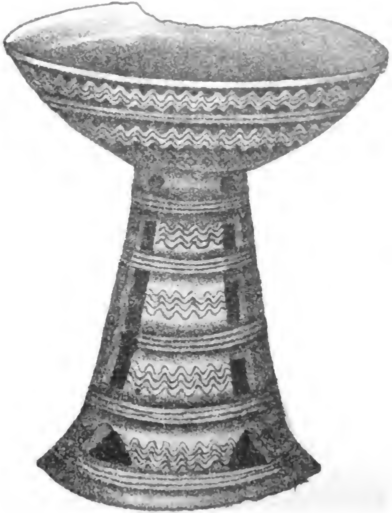


FIG. 2

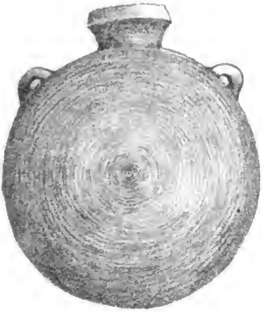
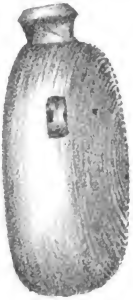
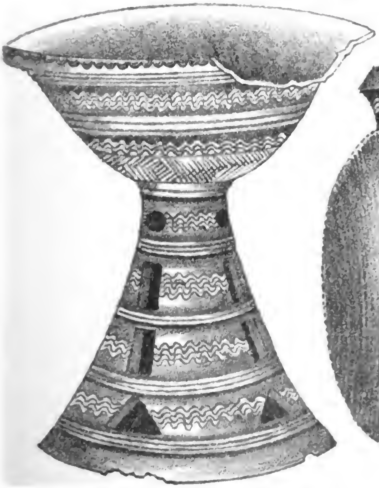


FIG. 3



SIDE VIEW OF FIG. 3



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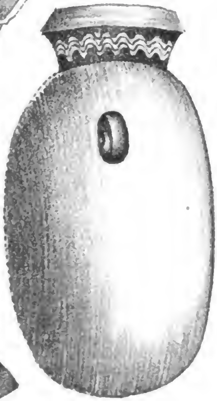


FIG. 5

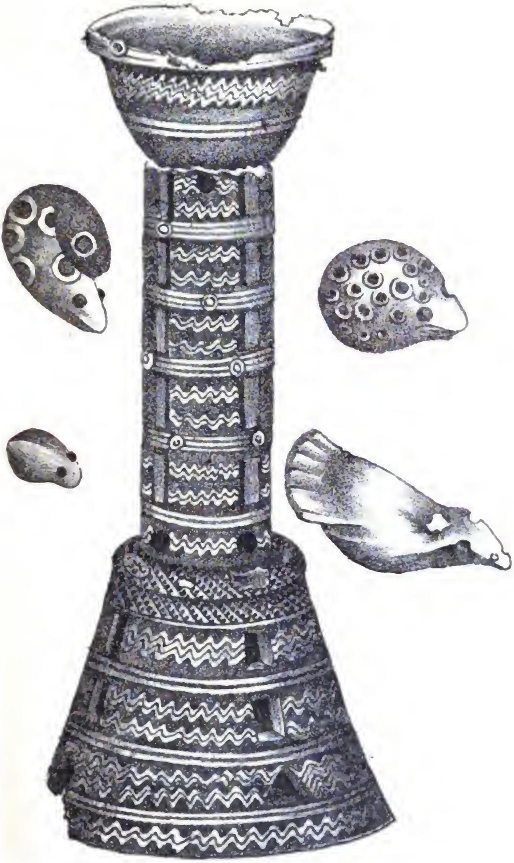
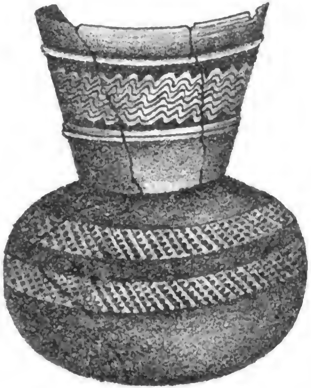


FIG. 6



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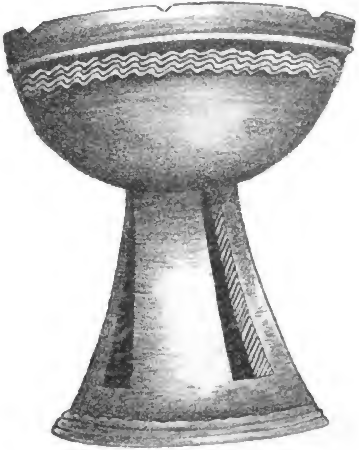


FIG. 8

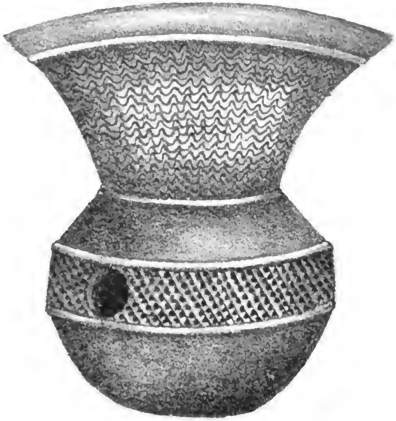


FIG. 9

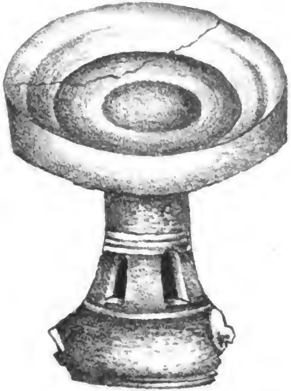


FIG. 10

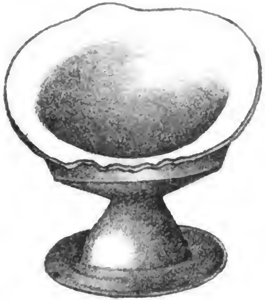


FIG. 11

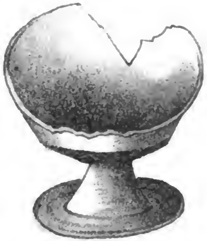


FIG. 12

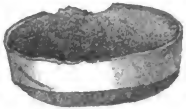


FIG. 13

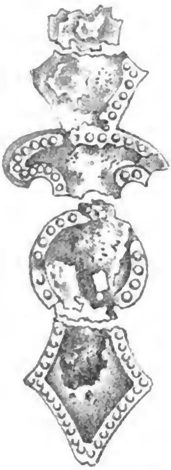


FIG. 18

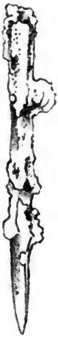


FIG. 17

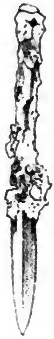


FIG. 16

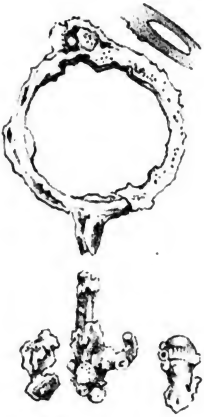


FIG. 15

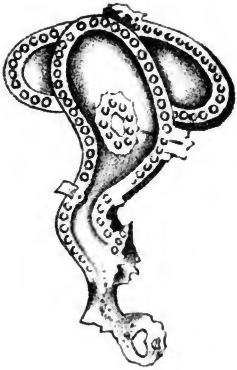


FIG. 14

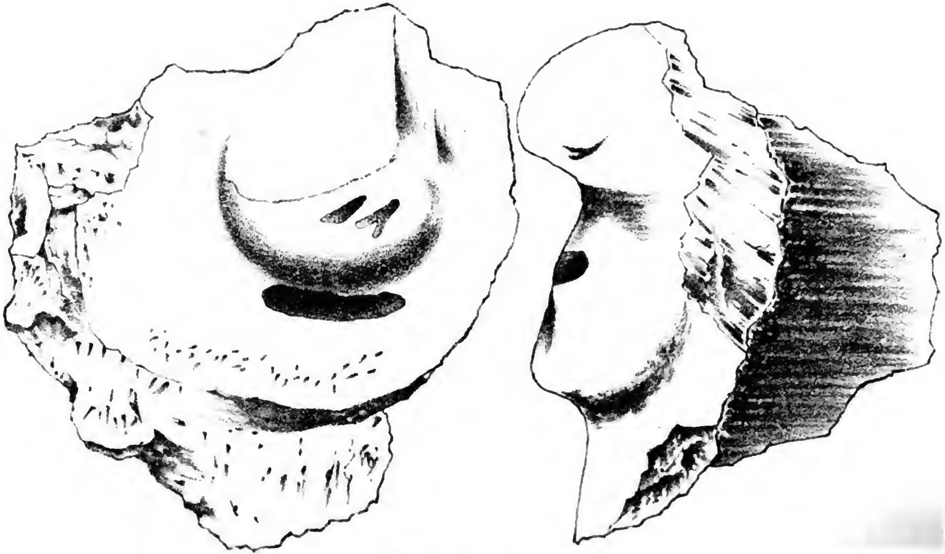


FIG. 19

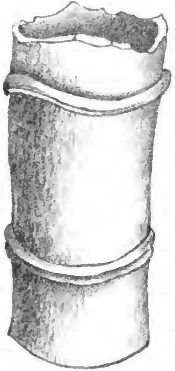


FIG. 20

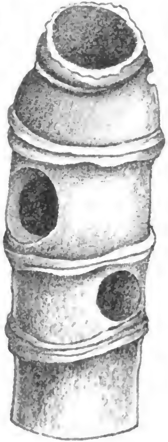


FIG. 21

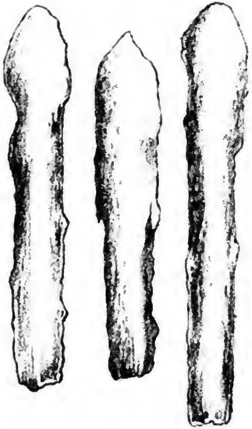


FIG. 22–4

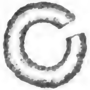


FIG. 27

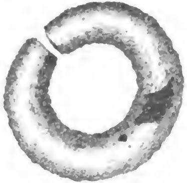


FIG. 25

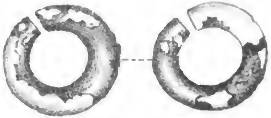


FIG. 26

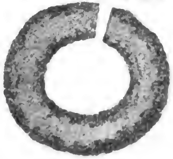


FIG. 28

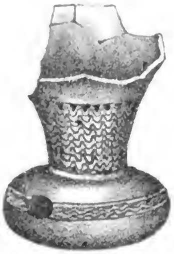


FIG. 29

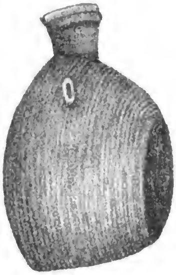


FIG. 30

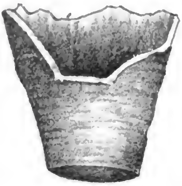


FIG. 31

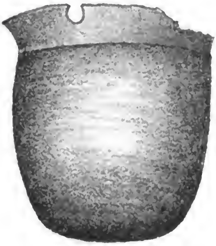


FIG. 32

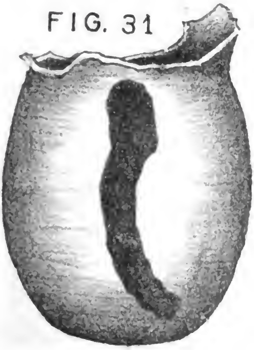


FIG. 33

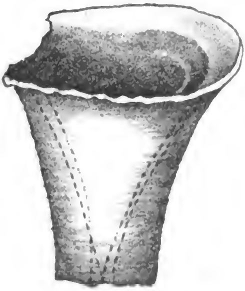


FIG. 34

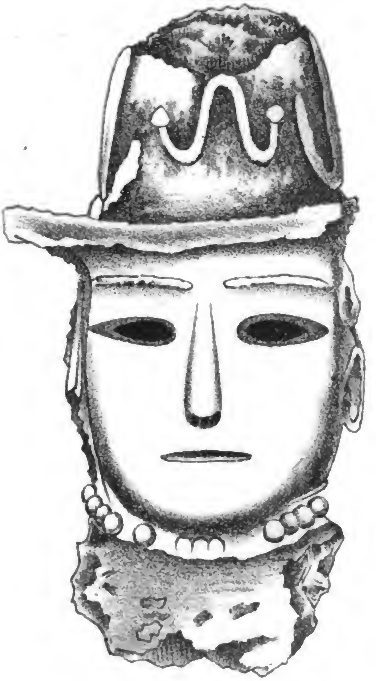


FIG. 35

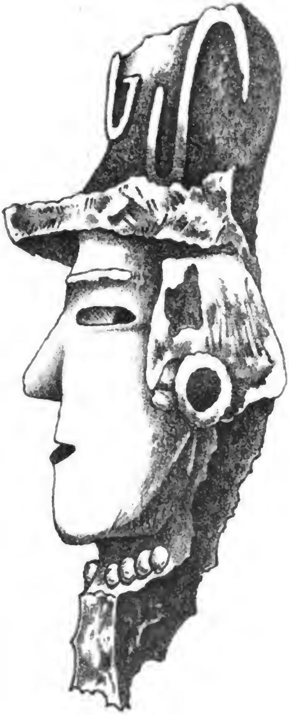


FIG. 36

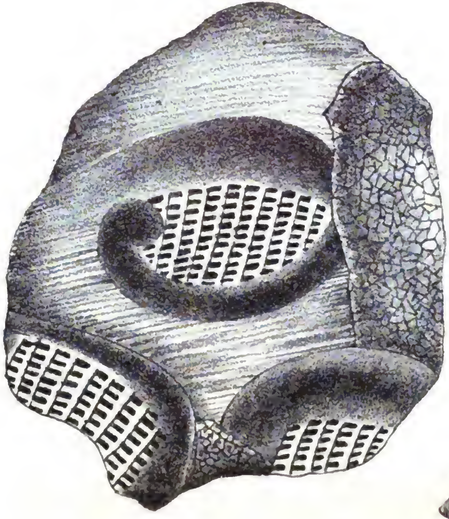


FIG. 37

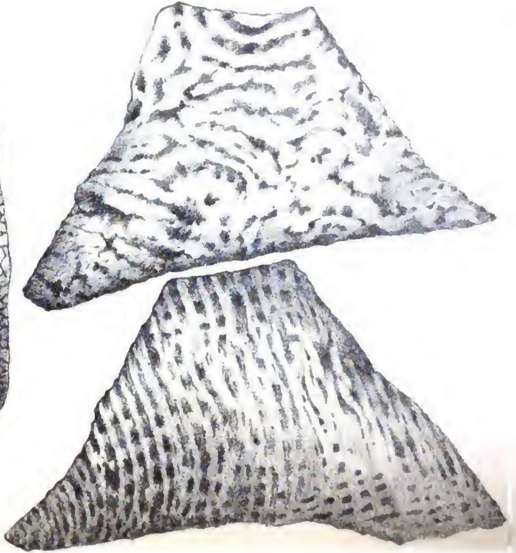


FIG. 38

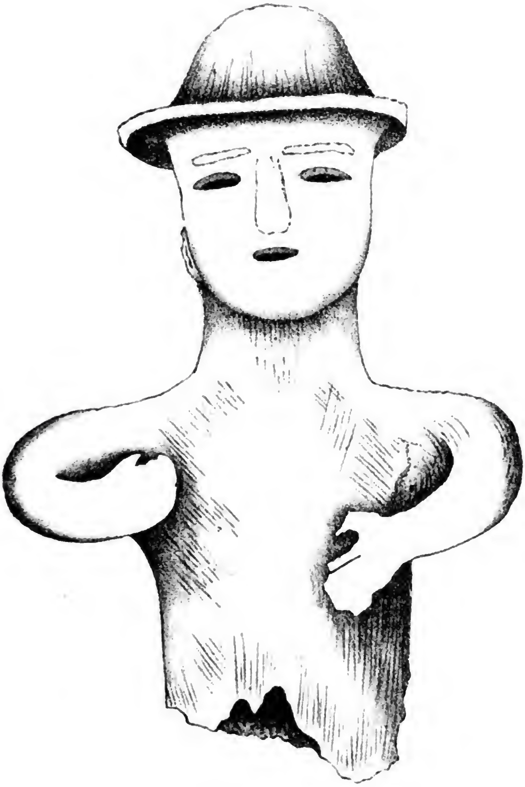


FIG. 39

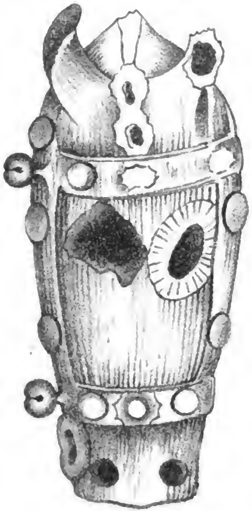
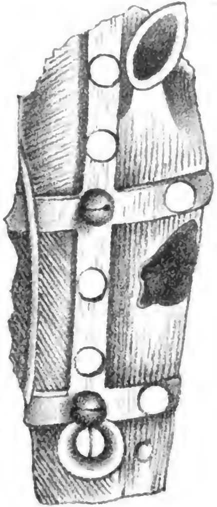


FIG. 40



SIDE VIEW

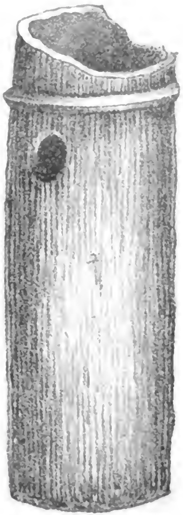


FIG. 41

ANCIENT JAPAN IN THE LIGHT OF ANTHROPOLOGY

BY

DR. RYUZO TORII

KOKUSAI BUNKA SHINKOKAI

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ANCIENT JAPAN IN THE LIGHT OF ANTHROPOLOGY

BY

DR. RYUZO TORII

FOR FAVOUR
OF REVIEW

KOKUSAI BUNKA SHINKOKAI
(The Society for International Cultural Relations)
TOKYO, 1935

△

EDITORIAL NOTE

It is the belief of many interested people, both foreign and Japanese, those living abroad and those living in Japan, that a firmly founded relation of mutual respect and esteem is necessary through scholarly study and appreciation of present and past cultures of other nations and peoples. To date the Japanese people have been deeply engrossed in appraising and studying the cultures of other nations, and the matter of interchange of ideas and cultures has been onesided. Although meagerly developed, this balance of mutual study and appreciation is gradually beginning to be restored by many Western students and interested friends.

However, owing to language difficulties and differences in modes of procedure, the Japanese people have not been very articulate or helpful in assisting foreigners to study and understand Japan. It is the desire of the Kokusai Bunka Shinkokai to assist all scholars, and others interested, in their study of Japanese culture, encouraging a true exchange of cultural study and appreciation.

The desire was partly materialized in the first "Kokusai Bunka Shinkokai Lecture Series on Japanese Culture" which began on October 15th of this year and came to a suuccessful close on December 6th. This pamphlet is the record of a lecture delivered by Dr. Ryūzō Torii on October 22 at the Peers' Club auditorium. The lecture was translated and read by Mr. S. Sakabe, who also interpreted the discussion.

December 1935

KOKUSAI BUNKA SHINKOKAI

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Ancient Japan in the Light of Cultural Anthropology

This lecture will be a general discussion of the civilization of the prehistoric and protohistoric Japan before the introduction of Buddhism in the sixth century A.D. It seems to me that most of you have so far depended chiefly on such books as the ***Kojiki, Nihonshoki*** and ***Manyoshu***, for the study of ancient Japan. But I propose to approach the subject with the aid of Anthropology and Archaeology instead of pure literature such as mentioned above. The subject, however, is too extensive for this given time, and I must necessarily limit myself to a brief summary of the subject based chiefly on archaeological facts.

The first question we ask ourselves is, " How long has Japan been inhabited ? " In the Far East there have been discovered skeletons and other vestiges of *Sinathropos Pekinensis* and other finds of fossil man. But in Japan proper and in Chosen there has been no discovery of any trace of the Palaeolithic Age, that is the Old Stone Age. But the mere fact that no remains have been found does not necessarily mean that there exists no trace of the Old Stone Age. All we can safely say is that it has not been discovered yet.

The earliest phase of culture in Japan belongs to the Neolithic Age, the New Stone Age ; and this stage of civilization is within the bounds of prehistoric Japan. The relics of this era are those

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of the aborigines of this country. On the question as to who the primitive inhabitants were, the scholars of today seem to agree that they were Ainu. I cannot unreservedly accept this theory—that the Neolithic vestiges are of the Ainu; but in this brief discussion I shall not go into the detail of the issue. It will suffice to say that they are very much Ainu-like, if not quite of the Ainu. The vestiges of the aborigines are to be found all over from Okinawa to Hokkaido. And the fact of this wide distribution seems to be an ample evidence of how long they lived the culture of the New Stone Age. Living as they did in this phase of human progress, their implements and weapons were of stone: stone axes, stone chisels, stone scrapers, stone arrow-heads, stone spear-heads, and so on. But some implements of bone were also in use. The pottery to be found in abundance among their remains is worthy of attention. Especially the earthen images are noteworthy in that they indicate the customs of those days—the hair-dressing, the facial features, tatooing, clothing and personal ornamentation and the use of "shu" or vermillion. They adorned their heads with bone-combs; they wore necklaces of bone and stone, and bracelets of shell round their arms. Their vessels have a common feature in shape, handles, and decorative motives. And especially in the last: there is "coiling" as well as lines in geometrical combination.

These aborigines must have lived in this country for a considerable length of time, and from their vestiges it is gathered that they lived in a primitive stage of civilization. But they did possess a culture, and should not be supposed to have been an uncivilized people. Some hold that among the tribes of prehistoric Japan were some Negritoes, but I dispute this hypothesis. It is true that this hypothesis will explain away the phenomenon of some Japanese having curly hair in Kyushu, and that curly hair is never a feature of the Mongol. But my explanation of the phenomenon is as follows. In Kyushu there lived some Indonesians such as the *Hayato*, and when those Indonesians migrated into that part of our country, they had already mixed with Negritos. And it is probable that some of the Negrito characteristics came out insistently by the law of atavism. The question thus answered, you will agree with me that it is not necessary to conclude that the country was inhabited by the Negritos. Furthermore, even if they had been the aborigines of the land, they could not have possessed the degree of culture that the remains of that age would credit them with.

We may pause here to examine a little more carefully the vestiges of the Stone Age in the light of cultural anthropology. Attention must be called first to their customs. The hair is dressed, the dress is a slip-over, and there is tatooing on the face. The manner of their fishing, namely the use of the bone-harpoon, and the manner of their pit-dwelling, point to a resemblance with the ancient peoples of the North-East of Asia—the Chukchi, Aleut, Koryaks, Eskimo—who may be classified as Palaeo-Siberian, or as, according to L.V. Schrenck, Palaeo-Asiatic. At any rate, the customs of our primitive inhabitants resemble those of the ancient peoples of Asia.

The points to note from the viewpoint of culture are earthenware vessels, coiling patterns, clay figures, and the use of "shu". From the fact that the images are almost all female, (the male images being very rare) it is concluded that they were not intended for toys but that they were deified.

The Stone Age relics discovered along the River Danube have given the name of the Danubian culture to that particular type of

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civilization. This culture is represented by its three outstanding features: the female clay figures, the coiling patterns, the pottery painted with vermillion. Now, as you have seen, the culture of our aborigines is characterised by the same three features. Of course it is not to be concluded that the people who possessed the Danubian culture and our aborigines had any direct ethnological relations. But this fact is mentioned here as a case of mere coincidence.

Our next concern is to find if there are in existence in the neighbouring countries of Japan such relics as those of our aborigines. So far in these areas there has scarely been discovered anything that bears resemblance to them. There is, as far as I know, a vestige of a similar type at Gladekow, in the Maritime Province or Primorskaya; but none at all either in Chosen, Manchuria, Mongolia, Siberia, China or the South Sea Islands. There is in Shantung Sheng a possible exception to this generalization, but it is quite questionable. Where, then, did our primitive inhabitants come from? This question has not been solved in the light of archaeology. The state of isolation of their culture is somewhat like the isolation of the Ainu who to this day live in Hokkaido, Saghalin and Kurile Islands, or of the Gilyak who still inhabit the delta of the River Amur, or of the Chukchi, Koryak and the Kamchadal. They are all independent of their neighbours, archaeologically speaking. Mr. Joyce has pointed out that there is a certain similarity between the earthenware vessels discovered in shellmounds in New-Guinea and those of ours in question. Indeed, his finds may be compared to ours, but they may be far from being of the same cultural stock. His discovery is mentioned here merely for your reference.

It is only when the aborigines had passed the peak of their civilization and were living in the last stage of the middle period or in the last period that the vestiges of our ancestors began to be seen. Let us agree here to call our ancestors "Japanese Proper". The remains of the Japanese proper are distributed widely all over Japan. In Kyushu, Chugoku, Kinai, and Tokaido, their relics are more abundant than those of the aborigines. Here I must call your attention to the fact that both the relics of our ancestors and those of the aborigines belong to the same Neolithic Age. There are, then, two kinds of Stone Age vestiges: one, those of the primitive inhabitants, and the other, those of the Japanese proper. Our ancestors, too, were in a stage of primitive culture, using stone implements and weapons, being hunters and fishermen.

It has been customary to begin the study of our people from the Protohistoric Age, that is the age when they made implements of metal, but nowadays scholars go further back to the Prehistoric Age. The vestiges of our ancestors point to a considerably long period that they must have lived in this country. Some hold, concluding from the remains, that the Japanese proper are a mixed race, and I share this view. But, again from the evidence of their relics, they were of the same ethnological stock, and the difference between each constituent tribe is far smaller than the difference between the aborigines and our ancestors. For their bone-implements, stone implements and ceramics are of the same type.

One thing to be noted here of the vestiges of our ancestors is the trace of Megalithic culture seen in the megalithic monuments, stone-circles, menhirs, tumuli, cairns, and some dolmen-like stones. These are quite absent in the remains of the aborigines, and it should be all the more notable that they exist only among the

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remains of our ancestors.

That our ancestors built stone-circles is told in the mythological legends and early literature. What is called " Iwasaka " is nothing but this stone-circle. "Iwasaka" is the circle of stones around the spot where a god is worshipped. Thus the building of "Iwasaka" was much practiced in the Protohistoric Age, but it was done in the Prehistoric Age as well. The remnants of the stone circles are found chiefly in Shikoku, Kyushu, Chugoku and Tokaido.

The ceramics of those days should be given as much attention as the implements of stone. For pottery is a record of a race : it reflects the psychology and spirit of the race in its shape, decorative motives and the use of handles.

The pottery of our ancestors in the Prehistoric Age is very different from that of the aborigines. The latter's vessels are basketly —an adjective invented by American scholars—meaning that they are made in the same manner as a basket is made, and the shape itself is much alike. They are thickly ornamented all over the surface, sometimes with coiling designs, and a huge handle is attached to them. Making a fine contrast to these, the vessels of our ancestors are symmetrical in shape. And in the making of the pottery, one should note, they did use a wheel, very imperfect as it was. The use of the wheel, as you know, is often a distinguishing feature of ancient peoples.

The general design is very simple, often with no pattern, or a few lines in geometrical combination. The " coiling " pattern is never used, and this fact differentiates the pottery of the two peoples. This subject really demands more consideration, but within the given time we shall have to leave it as it is, and take up another point. At any rate, the fact to be remembered is that our ancestors began inhabiting this land as far back as the Stone Age.

Thus when the Japanese people had lived here for some time and learned the art of agriculture, a new element was added to their own culture. This new element came from China through the Chinese immigrants in western Korea, or directly from both the south and north of China, or introduced by the naturalized Japanese subjects originally from China and Korea. The new element having been absorbed, there was formed a new civilization, the civilization of protohistoric Japan, generally called "jōdai" by our historians as against "shindai" or the age of myth. The "jōdai" is only a continuation of the prehistoric age, that is the Stone Age.

In the Japan of protohistoric days the clan system was prevalent, each clan being controlled by the head and watched over by its own guardian gods. Besides these gods of the clans, there were many other gods—gods of wood, forest, river, sea and of all natural objects. The point, however, which is worthy of note is that a natural object itself was never deified. A god may be conceived in a mountain, or a stone, or a tree, but the mountain itself, or the stone or tree, was never worshipped as the god himself. Therefore, the pantheism of Japan at that time was an idea of Conception. This idea is almost characteristic of the so-called Asiatic culture of Northern Asia. There were witches—"Miko"—in the service of the gods, taking care of all the rites. I regard the ancient religion of Japan as a form of Shamanism.(1) There were family shamans and professional shamans, and the Japanese shamans were the professional. Naturally, there were in use all the necessaries for the rites ; mirrors, jingle-bells, and nusa (hemp or paper pendants). The social life and relations had by then become more complicated. But time does not allow us to go any further in the discussion of this phase of their life.(2)

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(1) Primarily, the primitive religion of the Ural-Altaic peoples of Northern Asia and Europe, in which the unseen world of gods, demons, and ancestral spirits is conceived to be responsive only to the Shamans, the medium-istic magicians.

Now the implements of iron were becoming more and more useful. The material was iron-sand. The blacksmith forged arrowheads, halberds, daggers and swords. In China, weapons were being cast, but in Japan they were only forged. In the matter of ceramics they began making *hanibe* (a clay pottery) which was often intended for ritualistic use. This special use of it gave it two other names : *iwaibe* and *itsube* (both meaning pottery used for worship). Thus the prehistoric Japanese (proper) were making *hani-no-utsuwa* (a clay pottery), but later, in the Protohistoric Age, they began making *sue-no-utsuwa* (a primitive porcelain), together with the earthenware vessels. *Sue*, the primitive porcelain, had first been introduced from China, and in Japan it made a progress of its own. But it was only the process of baking that improved, and the shape itself of both *hani*-vessels and *sue*-vessels remained the same as before, the art of glazing being still unknown.

These vessels were all used for tabooing and magical purposes. The culture of the time, however, was the culture of weapons. Especially the workmanship in sword-making made some remarkable progress. This art is not a later development, as is often supposed, but a development as ancient as this. For a country in the Far East, the Japanese weapons of that time were in a well advanced stage.

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(2) In Japan the Shamans had originally been women, but in the protohistoric years there were also men Shamans. This is evidenced by an incident in the " *Nihon Shoki* ".

In the Reign of the Emperor Jimmu there was held a great festival. Michinomi-no Mikoto (a male deity) was appointed to preside over the festivities under the title of Itsu-Hime (or the Sacred Daughter).

Why was a male god given a female name on the festive occasion ? It is probably because the earlier Miko (mediumistic magicians) were women. All this may be regarded as indicative of the universal phenomenon known as " Change of Sex " in Shamanism.

Now, living in an age of agriculture, and the majority of the population being farmers, the mores, customs and religious rites, all had to do with agriculture. With rice and millet from the field, the game and animals in the mountains, fishes and shellfishes in the waters, Japan was indeed a country of plenty. There were several kinds of hemp for clothes; silk had already been introduced from southern China, and horses and cattle were domesticated for the use of the people. There were in use fine harnesses, some heart-shaped, whose outstanding feature is the honey-suckle pattern. The swordguards, the bulbs, (or the pommels) and sheaths were forged or cast and were plated with gold. Some of these articles are of cast-copper. The gold rings and silver rings used as ear-rings are sheet gold or sheet silver covering the substance of copper. And these display exquisite craftsmanship. These arts developed along with smithcraft. I would like to suggest to you the possibility of making a comparative study with the Sassanian and Scythian arts, tracing their influence in the heart-shape of the harness, its honey-suckle design, and the perforated design of animal heads in the sword-coins (or swordpommels). Mirrors were also in use; they had been imported from China, but later the art of manufacturing mirrors developed in Japan on its own, and the ***suzu-kagami*** (or the mirror garnished with jinglebells) is typically Japanese. The mirrors were used not so much for toilet purposes as they were for ritual use in religious services, given as they were a mystic significance. In addition to all these, the ***magatama***,

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kudatama and bells were also used for personal ornamentation, the first two being their necklaces.

Their house was a wooden hut erected high above ground; the uprights were pillars and the roof was of course, thatched. The "torii" you see now at every shrine is a reminiscence of their gate. It linked the two ends of the circular fence around the house. The entire construction of their dwelling was simplicity itself. But in this connection we must observe their tombs.

Stone coffin and sarcophagi frequently occur within a sepulchral mound—in most cases a chamber of stone or clay provided for the deceased. The tumulus often attained majestic proportions far exceeding those of the house. Our ancestors believed in the immortality of the soul; to them the tomb was the intermediate world between this and Hades, the eternal abode of the souls. This is very much like the idea of the Egyptians who thought this life only temporary and believed in a long future life, and who, in this belief, practised embalming corpses. Like the Egyptians, our ancestors, before the influence of Buddhism and Confucianism began to make itself felt, buried their dead in their formal attire, and together with them such articles as daggers, swords, and other belongings of the deceased. There was prevalent, also, the practice of killing the retainers and attendants, and of permitting them to commit suicide, on the death of their master. This custom, known as "***junshi***" is typical of old Japan. In an ancient grave are often found more than a few skeletons, instead of the remains of just one man. And it is not seldom that a burial mound is surrounded with a circle of attendant graves of those who followed the master on the journey to the other world. The ***haniwa***, a later invention to substitute clay figures for living men, are an important index to the study of the customs then prevalent. I cannot emphasize too much the importance of the tombs, in the study of Protohistoric Japan. But, again, no further discussion is possible today within the limited time.

Among the aspects of the old civilization proper to Japan the following are most note-worthy—religion, social life and relations, agriculture, smithcraft, weapons and armours, tombs and megalithic relics. This civilization was long continued down to the historic times, and finally with the additional influence of Buddhism, it has come to be the civilization of Japan. The students, therefore, of the Nara period or of later times, must necessarily be familiar with the facts of the ancient times with which my lecture today has been concerned.

One word more in conclusion—and that is about the *dōtaku* (bronze bell, which seems to find no English translation : the German scholars call it a " Methalltrommel ".) This seems to be a vestige of a cycle of events quite separate from the two ages we have studied. For this is not met with among the relics of the Prehistoric Age, nor are they found within the tombs of the following era. What, then, was the nature of this *dōtaku ?* It appears to be a musical instrument, intended also for religious use. It has been known that the *dōko* (bronze tabor or hand-drum)—and not *dōtaku*—was used by such tribes as Miao, Yao, and Shan in Southern China and Indo-China, where this bronze tabor was found in every chief's home and was used both as a musical instrument and as part of their religious rite. The use of the *dōtaku* by our people is believed to have been similar to the use of the *dōko* by these tribes. There are older *dōtaku* and newer ones. The ones with decorated sections are regarded as old, and those with

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plain areas new. I once made a comparative study of our *dōtaku* and the *doko* of Southern China, and found their similarity being carried still further. For the *doko* with plain sections are new and much like ours. And the manner of their discovery, and their purposes—that is, musical and religious—are also alike. The customs depicted on the *dotaku* are not those of the North, but of the South. They picture men with a kind of sedge-hat, a sleeveless costume like the costume that the natives wear in Burma, Siam, Annam, the Philippines and Formosa. They picture men pounding grain in the mortar. Their house is built high above ground to be climbed into by the use of a ladder. Their boat is large enough for several persons, and the shape is slightly curved. Now, the customs represented on the *doko* are the same—the men, the pounding of grain, their dwelling, their boat. We have reasons, therefore, to suppose that the *dōtaku* is of a Southern-Asiatic origin, and one may do well to compare our *dōtaku* with the *doko* of the Southern tribes already referred to—the Miano, Yao, or the natives of Burma, Siam and Annam.

There are some who hold that there was a Bronze Age in the history of Japanese civilization, and their theory is based on the discovery of huge forged swords of bronze in the north of Kyushu, Chugoku, and Shikoku. This is not a generally acceptable theory; for these swords were meant for ritual use and not for practical purposes. And if there was a Bronze Age in Japan, there should be found bronze axes and other implements of bronze, none of which, as a matter of fact, has been discovered.

I have thus made a cursory survey of the field of cultural anthropology with reference to the Japanese people. I shall be more than happy if you have gained, by attending this lecture, an insight into this branch of science and what it has accomplished. I have pointed out many possibilities of further study and research, and I hope it will be my good fortune to meet you again to carry on our discussion on more specific subjects.

[illegible] 3. September [illegible]

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DISCUSSIONS

Q. Are *magatama* peculiar to Japan ?

A. *Magatama* are peculiar to Japan and Korea. Originally the shape of *magatama* was modelled on tusks or fangs of animals. For a long time in Japan it has lost its original association with the fang. It has simply taken an artistic shape.

Q. Where was rice first cultivated ?

A. From the fact that on *dōtaku* there are pictures of men who seem to be pounding rice it may be inferred that rice was cultivated as early as the time when *dōtaku* were made. You may reason therefore that since *dōtaku* were found in Chugoku and its neighborhood that rice was found there also. However, it may have been not rice but millet or barn-yard grass.

Q. About how large is this *dōtaku ?*

A. As an example the height of this particular *dotaku* is 42.5 centimeters. Those with plain areas are much taller than the decorated ones.

Q. Does Dr. Torii believe that the early Japanese houses were like those pictured on the *dotaku ?*

A. The fact that the Japanese house was erected high above the ground is not inferred from the pictures of *dōtaku*. It is known from other sources.

Q. From what era were iron weapons used ?

A. There was no Bronze Age as you know from the lecture. The Iron Age immediately followed the Stone Age. The use of iron was comparatively common in Asia as compared to the rest of the world.

Q. Are many imitations of ***dōtaku*** made ?

A. The ***dōtaku*** is not made now. It is very possible that imitations are being made for commercial purposes.

Q. What is the approximate year ***dōtaku*** were made ?

A. When they were first made is not certain. But their discovery took place as early as the Reign of the Emperor Tenji, of the Nara period. So they must be of great antiquity.

Q. Are there any traces of mummies—like those found in Egypt ?

A. None at all.

Q. What is the relationship between ***magatama*** and ***tomoye ?***

A. ***Tomoye*** is the shape of a ***tomo,*** used to protect the arm in arrow-shooting from scratch. There is no relationship between ***magatama*** and ***tomoye.***

Q. Is Dr. Torii willing to explain the location of these excavations ?

A. In the province of Hyuga, which, the mythological legends hold, is the seat of our ancestors.

Q. What is the period of their arrival in this country ?

A. It is hard to say when it is a mythological event.

Q. What is the relation between the Ainu and the Japanese people.

A. The Ainu are the aborigines of this land. It is generally not believed that there is an ethnological relation between the original Ainu and the original Japanese people. Our ancestors must have come from elsewhere, and not of the same stock as the Ainu.

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Q. In the lecture did you go back to the Koro-pok-guru pre-Ainu period ?

A. No, we did not go back to that period. Dr. Tsuboi's theory is not accepted nowadays.

Q. Were there any coins found in these tombs ? If so, what metals were used ?

A. There are no coins found at all in these protohistoric tombs or elsewhere, but sometimes you will find sheet gold or silver.

Q. What are the oldest known coins in Japan ?

A. Before any Japanese coins were made coins were introduced from China. They were first made during the Nara period and of copper.

Q. What was used in place of coins ?

A. There was no monetary system in protohistoric Japan, but a system of barter. The standard medium for barter was rice. Further excavations may find traces of earlier coins.

Q. Were shells used for coins in Japan, or only in China ?

A. That is entirely Chinese. Dr. Torii mentions one kind called *koyasugai* but it was never used in Japan. In our country barter was in commodities. In earlier days barter was made with a bow string or a piece of cloth or a handful of rice.

Q. Was the excavation made in a cave or mound ?

A. The excavation was made in a mound.

Q. Were the groups of mounds shaped in any particular geometrical form ? Any resemblance to the mounds discovered in the United States ?

A. No, not in any particular geometrical form, but they were grouped in such a way that in the centre was the main one or the master's and around it the smaller tombs which were those of the attendants or servants. It was the custom for the attendants or servants to kill themselves when their master died in order to follow him on his journey to the other world.

Just to show you the size of these tombs, I wish to say that the tombs of the Emperor Nintoku took forty years of construction. He had to prepare this before his death.

Q. Were there any cave dwellers in Japan ?

A. Both cave dwelling and pit dwelling were practiced by the aborigines but not by the Japanese proper. There are traces of pit dwellings right here in Tokyo —in Yamanote, and in the districts of Chichibu, Tamagawa and Musashino.

Q. What are the caves found in Kamakura ?

A. They are just burial places or graves.

Q. Was it a habit to bury these three treasures—the sword, *magatama* and mirror ?

A. They did not bury these in historic times. This was only in the protohistoric era. During the Nara period the *magatama* was used for ornamental purposes. With the introduction of Buddhism it was used in the shape of a rosary for religious rites.

It may be well to note here that the introduction of Buddhism has changed much of the nature of the civilization the Japanese proper had.

Q. How far back did they use matted floors ? Were they used by other Asiatic people ?

A. You know how the *tatami* is made. The top part or mat was used as far back as protohistoric times. It may have come from the southern part of China. It was used for the same

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purpose as now.

Dr. Torii would like to emphasize the fact that the civilization prior to the introduction of Buddhism was very masculine, reminding us of what the Teutons and the Germans had before they accepted Christianity. Weapons, harnesses and such things were buried together with the dead, but the introduction of Buddhism has weakened this virility. The masculinity of the early civilization has been gradually lost.

ILLUSTRATIONS

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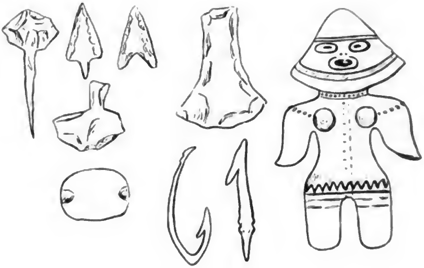
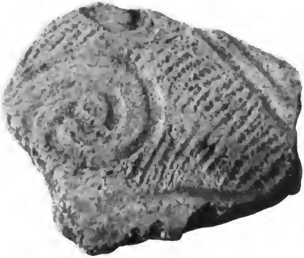


1

Implements of Stone (See p. 2)
Female Earthen Image (See p. 2)



2

Potsherd Torii Collection
(For its design, see p. 3)

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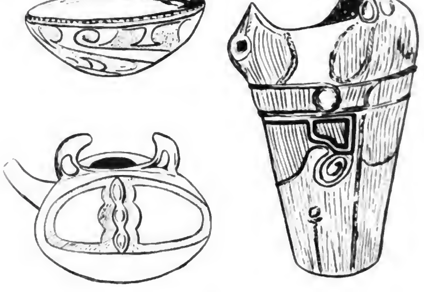
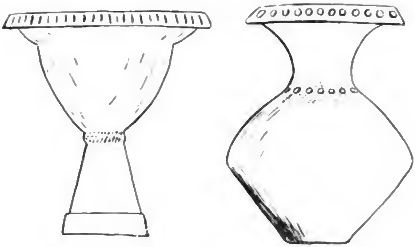


3

Pottery of the Aborigines
(For its shape and design, see. p. 3)



4

Pottery of Japanese Proper
(For its shape and design, see p. 6)

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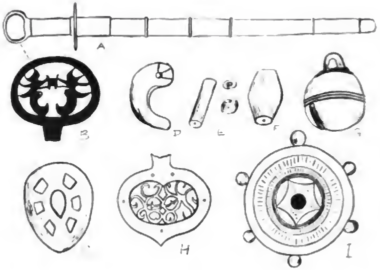
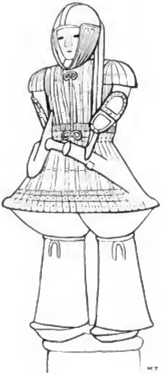


5

A. Sword
B. Perforated Sword-pommel
C. Sword-guard
D. *Magatama*
E. F. *Kudatama*
G. Bell
H. Heart-shaped Harness
I. *Suzu-Kagami*

(For the description and significance
of these articles, see pp. 9, 10)



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HANIWA (See p. 10)

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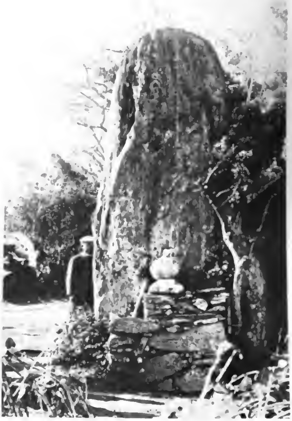

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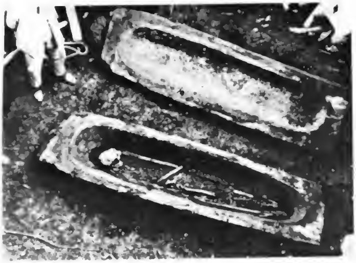

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Burying the Dead with Swords, Daggers and Other Belongings (See p. 10)

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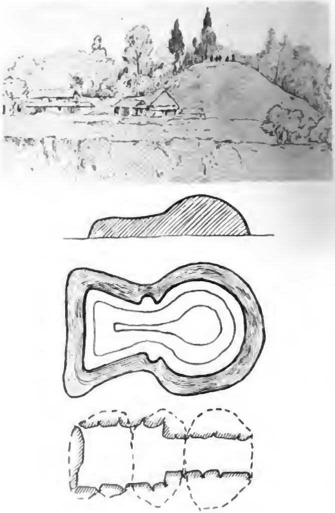
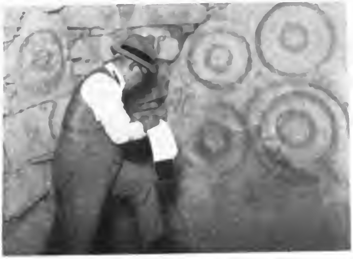


9
Tumulus of Nobeoka, Hyuga (See Discussion)
Section-Plan of the Tumulus (See Discussion)



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Stone Chamber (See p. 10)

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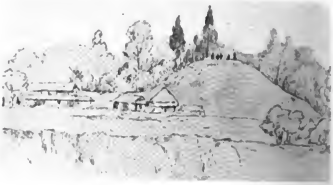

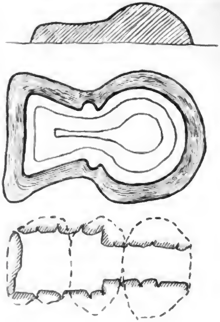

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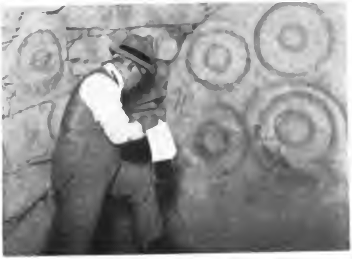
Tumulus of Nobeoka, Hyuga (See Discussion)
Section-Plan of the Tumulus (See Discussion)



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Stone Chamber (See p. 10)

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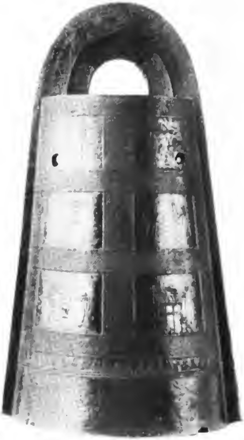

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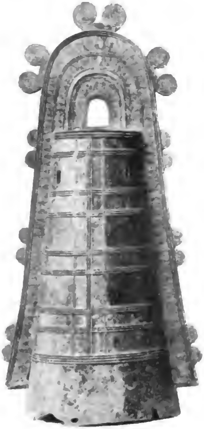
Dotaku with Decorated Sections (See pp. 11, 12)



12

Dotaku with Plain Areas (See pp. 11, 12)

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KOKUSAI BUNKA SHINKOKAI

(The Society for International Cultural Relations)

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In this connection the Society hopes to undertake all the necessary tasks falling within its province and to keep in contact with, or to extend proper assistance to, individuals and organized bodies actuated by analogous ideals both at home and abroad.

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Institute of Pacific Relations

Preliminary Paper Prepared for
Second General Session
July 15-29, 1927

The Japanese Race from Anthropological Point of View

By
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Assistant Professor of Anthropology,
Imperial University, Tokyo

HONOLULU
July, 1927

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The Japanese Race from Anthropological Point of View

It may be possible to clarify the racial position of a people or a local clan through the study of records, customs, and languages, but it is more satisfactory to found the basis of such investigations upon less variable factors. For this reason physical characteristics are by far the best means for the purpose. Now there are two methods in the study of physical characteristics, namely (1) observation and (2) measurement. The former implies the observation of the color of the skin, the character of hair and the color of the eyes, etc., while the latter has to do with the measurement of various parts of the body.

What I wish to present in this paper is the latter method. Hitherto it has been the general practice in investigations through measurements to use as the representative value primarily the "mean" or average of the measurements taken, adding to this the minimum and the maximum to show the two extremes. Doubtless this method has much value, but it is extremely dangerous to depend solely upon it. Therefore, in recent years the tendency is to put more stress upon the substance, so to speak, by computing the variability by means of mathematical statistics. That is, to compute the standard deviation and coefficient of variation to show variability, and coefficient of correlation to show by figure the presence or absence of relative variation between two natures. The use of these values—unlike the case of mere comparison of the "mean"—enables us to compare the degree of race-mixture.

From this wide range of physical characteristics, I have chosen for my present purpose to concentrate upon two, head-form and stature. These are of especial value in representing racial peculiarities.

The value of these two characteristics has been recognized in the usual calculations based on measurements, but in particular it can also be demonstrated that they are valuable from the standpoint of the above-mentioned mathematical reasons or variability.

In order to study the Japanese race from the anthropological point of view it seems to me essential to know its racial type or local differences. Therefore, I have tried to observe chiefly the local differences that are apparent in the Japanese race. It became necessary for this purpose to select a definite geographical division as th basis of comparison, and I have therefore chosen the birth-places of the parents of those who served as the subjects of my investigations; in other words, I have retraced one generation in determining this geographical basis. Furthermore I used for my study only those whose parents were both born in the same province, a total of 6000 males (students) and 2000 females (students).

Confining this problem for the present to the male subjects, we find that the "mean" and "variability" of both head-form and stature

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differ considerably in the different provinces. Summing up briefly, in the case of the "means," we note the following: Brachycephalic is found in the southern part of Kyushu, in Honshu it extends from Chugoku to Kinki district and Shinano province, and in Rikuchu and Ugo provinces farther north. Dolichocephalic is found in the western part of Kyushu, in Honshu from San-in to Hokuriku embracing the territory facing the Japan Sea, and from Kanto northward, including the territory facing the Pacific ocean. Mesocephalic, which is the intermediate type, is found scattered throughout the territories which lie among the districts occupied by the two fore-mentioned types.

Observing the distribution of variability as regards head-form, we find a large degree of variability in Kyushu, Chugoku and Kinki districts. On the other hand we find the degree to be small in most of the territory north of Kinko. This is an interesting fact. Generally speaking, the greater the race-mixture, the greater the variability, and conversely the purer the race, the smaller the degree of variability. It so happens that many of the western provinces of Japan had extensive intercourse with foreign countries and received the benefits of civilization at a very much earlier date than the northeastern provinces. The foregoing facts appear to coincide very closely.

With respect to the "mean" and "variability" of stature, we find local differences as in the case of head-form but not to so pronounced a degree. That is, those of medium statue are found scattered everywhere; the "short-statures" and the "tall statures" are found only in very small groups. The variability of stature also fails to show as definite a situation as that of head-form; its indications are rather inconclusive.

In the foregoing statement showing the situation with respect to distribution, I have treated separately "mean" and "variabiliy" of both head-form and stature. But if we would come to closer grips with the facts we must make the classification by considering the "mean" and "variability" together. However, that is far from being an easy task. So after much deliberation I decided upon the somewhat laborious method of computing the "probable error of the difference of the means" and comparing the figures thus obtained. If the difference of the "means" is found to be more than three times this probable error, it is generally understood that the difference in the averages of these two is significant and cannot be ignored as an accidental difference arising from random sampling. Therefore, I applied this method to head-form and stature separately to subjects from 75 provinces; the results obtained were far more accurate than in the case of a direct comparison of averages.

Taking this method and considering local differences of the Japanese in head-form, we get the following results: brachycephalic is found in definite groups in southern Kyushu and Kinki districts and vicinity; dolichocephalic is found in western Kyushu, in a part of the territory facing Japan Sea, and in the districts facing the Pacific, with Oki and Hoki distinguished as most typically dolichocephalic; mesocephalic is found in eastern Kyushu, in a part of Chugoku, and in the Tohoku district north of Shinano. In like manner stature also varries in accordance with definite groups.

By combining the local differences observable in head-form and stature it is possible to recognize nine distinct local groups among the Japanese as follows:

Head-form	Stature	
Brachycephalic	High	(1)
	Medium	(2)
	Low	(3)
Mesocephalic	High	(4)
	Medium	(5)
	Low	(6)
Dolichocephalic	Medium	(7)
	Low	(8)
Very Dolichocephalic	Low or Medium	(9)

Finally, let us compare the local differences based on a comparison of averages of head-form and stature among Japanese with similarly determined differences among the peoples of neighboring countries. If it were possible to apply the more complicated method of comparison it would be very convenient in clarifying the differences between the Japanese and neighboring peoples, and would moreover enhance the degree of dependability. But unfortunately all investigations of Asiatic races have heretofore been based exclusively on averages and not on the principle of variability, so we are compelled to base our comparison solely on averages. Now such light as is thrown on this particular subject by the direct comparison of averages shows that those peoples whose head-form and stature closely resemble the Japanese are the various races of eastern Siberia, southern China, Indo-China, Formosa, Philippine Islands, Borneo and Sumatra. Among these races there can be found other points of resemblance to the Japanese in physical characteristics. We must, therefore, consider that they are more closely related to the Japanese than the various peoples belonging to other racial stocks. Consequently, even if there should be among Europeans some whose head-form resembles the Japanese, we could not possibly accept that as evidence of a relationship similar to that which exists between the Japanese and other Asiatics. We must conclude, consequently, that racially speaking the Japanese are closely allied with eastern Asia.

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DOLMENS

IN JAPAN.

BY

EDWARD S. MORSE.

[Reprinted from The Popular Science Monthly, March, 1880.]

NEW YORK:
D. APPLETON AND COMPANY,
1, 3, & 5 BOND STREET.
1880.

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DOLMENS IN JAPAN.

BY

EDWARD S. MORSE.

THOUGH a large amount of material has been collected and published regarding the megalithic structures of Europe, their classification is in a somewhat unsatisfactory condition.

The misery of the systematist has already made itself apparent in synonyms for a well-known class of monuments—namely, the dolmens. To make the matter more perplexing, structures of quite a different form, and possibly intended for a different purpose, are called by the same name.

A dolmen, generally speaking, consists of an arrangement of stones, few or many in number, supporting one or more stones in such a way as to inclose a cavity beneath. These supporting stones may form the four walls of a chamber, which may or may not be covered by a mound of earth. This chamber may or may not communicate outwardly by a long, narrow gallery (*allée couverte*). The mound may or may not have one or more rows of stones encircling it. And, finally, the stone structure may be on top of a mound of earth, instead of beneath it!

The simplest form of dolmen, if indeed it can be compared to the more elaborate structures bearing the same name, consists of several standing stones supporting one or more stones which rest upon them horizontally. If the roofing-stones rest with one end upon the ground, then it is called a demi-dolmen. A holed dolmen has one of the supporting stones (which generally forms one side of a square chamber) perforated. The demi-dolmens are not sufficiently specialized to establish any line of distribution. The holed dolmens are found in France and in India, and their curious resemblance has led many to believe in their common origin.

In the mound-covered dolmens a relationship is also seen between

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those of Brittany and Scandinavia, in the passageway generally opening toward the south or east and never to the north.*

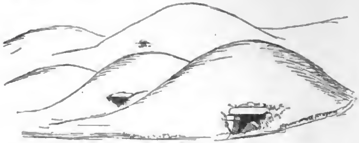

FIG. 1.—GENERAL APPEARANCE OF DOLMENS.

From the mass of observations brought together regarding the dolmens, Mr. Fergusson † has prepared a map showing their distribution in the Old World. From this map, dolmens are found to occur in the greatest number in France. They are also found in various parts of Great Britain, more abundantly on the eastern coast of Ireland, western coast of Wales, eastern coast of Scotland, southern portion of Sweden, and in Denmark and Northern Germany; also on the coast of Spain, Portugal, Northern Africa and the western portion of India. Mr. Fergusson, at the date of the publication of his book, asserts that the typical dolmen had not yet been found in America.

The occurrence in different parts of the world of a mound of earth containing a stone vault or chamber can not be looked upon as evidence of a community of origin, because such a structure seems to be a most natural form for the purposes of burial. The same structures are built to-day in many countries. It is only when it possesses some

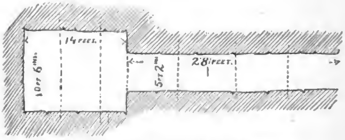

FIG. 2.—PLAN OF CHAMBER. The dotted lines show the roofing-stones.

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* Lubbock, "Prehistoric Times," p. 124.

† Fergusson, "Rude Stone Monuments," 1872.

peculiar feature, like a perforation in one of its wall-stones, or a certain direction in which the passageway opens, that it suggests the idea that a common origin may be ascribed to those possessing these peculiarities.

In traveling across the southern part of Yeso last year, and also in a journey overland from the northern part of Japan to Tokio, I scanned the country carefully for mounds or monuments of any description. At the entrances of towns, one often sees two large mounds between which the road runs. Each mound is often surmounted by a large tree. Though these mounds are old, they are not prehistoric. With the exception of these, I saw nothing that would suggest a monument coming under the names of dolmen, menhir, etc.

There are many burial-mounds in Japan, such, for example, as the large one in Yamato, the grave of Jimmu Tenno, and others which are known to belong to historic periods. It is not improbable that the dolmens to be described belong to the same category.

It is difficult for one who has not traveled in Japan to realize the almost universal state of cultivation the country is under. Having a population of 33,000,000, largely given to agriculture, with an area not exceeding 80,000 square miles, one may imagine how few tracts of uncultivated land are found. One is amazed at the sight of ranges of hills and mountains extending for miles, and all terraced to their very summits, for the cultivation of wheat and other products. The lower levels for miles are ditched and diked for rice-cultivation. This is specially marked along the coast bordering the Inland Sea, and along the western coast of Kiushiu from Nagasaki round through Higo to Satsuma. This widespread cultivation has necessitated the leveling or other modifications of large tracts of country, and with this disturbance have probably disappeared many evidences of an ancient race. My attention was first called to the existence of some curious stone structures near Osaka, by Professor Yatabe, of the University of Tokio, who had received a letter from Mr. Ogawa, of the college at Osaka, with the request that I should examine them. This letter, accompanied

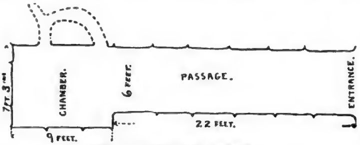

Fig. 3.—Plan of Chamber. Usual form.

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by a few sketches, was published by Professor Yatabe in a Japanese periodical in Tokio.

On my return from an expedition to the southern portion of the empire, I visited Osaka with my assistant, Mr. Tanada, for the purpose of examining these structures. Mr. Ogawa and Mr. Amakusa, both teachers in the Osaka College, kindly accompanied me and rendered much assistance in the work of exploration. Our time was too limited to do more than make a hasty reconnaissance. We left Osaka early in the morning by *jinrikishas* (vehicles drawn by coolies), our way leading across extensive rice-fields, and our course directed to a range of low mountains about ten miles away. The country was as flat as a prairie, and had evidently been the floor of the sea at no remote geological period.

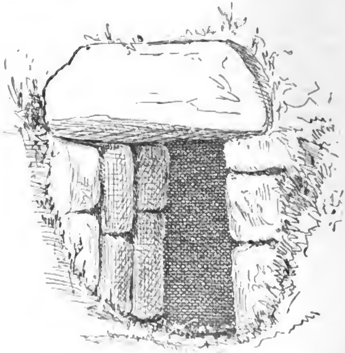

FIG. 4.—ENTRANCE TO CHAMBER.

The dolmens are found in the villages Hattori Gawa and Kori Gawa, which lie at the base of a low chain of mountains. Having reached Hattori Gawa, we left our *jinrikishas*, and hunted up the headman of the village who was to accompany us to the dolmens.

Providing ourselves with candles, we started up a rather steep road, and after a while diverged to the left, down through a tangled ravine —stopping at the door of a temple to examine an old pot which was brought out for our inspection, and which proved to be a piece of Bizen-ware, not very old. Shortly after, we came to a group of dolmens. They are widely scattered in groups of several along the slopes of the mountains for a considerable distance; and their general appearance is not unlike the mounds of Upsala, Sweden, as represented in the frontispiece of Lubbock's "Prehistoric Times."

The structures consist of stone chambers covered by mounds of earth, communications with the chamber being by means of a long, straight, narrow passage—a typical *allée couverte*. The apices of the mounds are not so pointed as in the figure of Lubbock, and their slopes not so steep (see Fig. 1). They average fifteen to twenty feet in height, and fifty to seventy-five feet in diameter. The entrances to most of the chambers are partially obstructed by dirt and stone which have tumbled from the sides and roof of the entrance. The stones composing the walls of the passageway and chamber were not large. In every case, however, the roofing-stones, both of the passageway and chamber, were of very large size. In some cases the entire roof of the chamber consisted of a single stone, and in one case four huge blocks formed the roof of a passageway twenty-eight feet long (see Fig. 2). In every case, too, the stone which covered the passageway adjoining the chamber and forming part of its wall was of great size. The variation in the length of the passageways is due to their partial destruction. The other dimensions are quite uniform, as will be seen by comparing the following measurements of nine chambers, taken at random:

Length of Chamber.	Breadth of Chamber.	Height of Chamber.	Length of Passageway.	Breadth of Passageway.	Height of Passageway.
14·0	10·6	11·6	28	4·3	5·3
9·0	7·3	8·6	22	5·6	5·8
14·0	11·8	8·9	7	4·5	5·0
13·0	7·0	6·8	20	4·6	5·0
14·0	6·4	8·6	14	4·3	6·0
11·0	5·6	8·7	11	3·6	5·3
12·0	5·8	8·3	*	4·1	5·0
12·4	8·2	12·0	*	4·4	6·0
13·8	7·9	10·2	*	5·0	6·3

The plans vary but little—a single chamber, with the right wall flush with the right wall of the passageway, as in Fig. 3; or else the passageway entering the chamber on a median line, leaving a jog on each side, as in Fig. 2. Mr. Ogawa informed me that he had seen one with a small supplementary chamber leading from the end of the larger chamber.

* Passageway partially destroyed. Measurement in feet and inches.

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The passageway was nearly a foot narrower at the top than at the base, and in some cases was slightly narrower at the entrance.

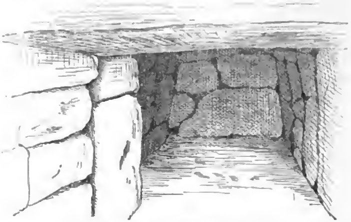

FIG. 5.—APPEARANCE OF CHAMBER FROM PASSAGEWAY.

In one case only were there signs that the chamber had been used as a place of residence. A small opening between two of the wall-stones at the base of one of the chambers appeared blackened by fire. By removing the dirt and smaller stones which had tumbled down, I managed with some difficulty to crawl into an irregular flue which was blackened with smoke. This flue communicated with another smaller flue leading back into the chamber (see Fig. 2).

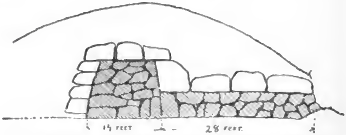

FIG. 6.—LONGITUDINAL SECTION OF DOLMEN, SHOWING CHAMBER AND PASSAGEWAY.

A rude sort of plaster was observed in some of the caves.

The walls of all the caves examined were carefully scrutinized to detect if possible signs of tool-marks or inscriptions, but nothing of the kind was observed. A careful search was made also for relics of some kind, but the floors were equally bare. Trenches were also dug down to the undisturbed soil, but no traces of pottery or implement of any description was found. This result is not surprising, when it is known that during the feudal days these chambers were often used as places of refuge for outlaws or political refugees, and during these times the earlier relics were probably removed or destroyed.

History records the fact that the governors of various provinces in which underground shelters occur ordered the closing of these places as a necessary measure.

No great antiquity can probably be assigned to these structures. That they are over a thousand years old there can be no doubt.* I am told by Japanese scholars that their early records call attention to these megalithic chambers existing in different parts of the country. Many of them have been destroyed, either for the purpose of securing the stone they contained for building materials, or to gain ground for cultivation.

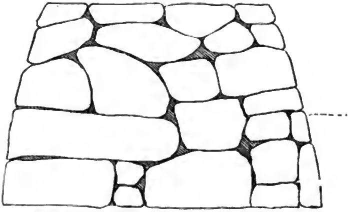

FIG. 7.—SHOWING ARRANGEMENT OF STONES IN SIDE-WALL OF CHAMBER. Length, 14 feet; height, 11 feet 6 inches. The dotted line to the right shows roof of passageway.

In the vicinity of the dolmens and in the paths leading to them, fragments of a hard, blue, unglazed pottery were found; and these fragments are identical with vessels dug up in various parts of the empire, which are regarded by Japanese archæologists as being of Corean origin, from nine to twelve hundred years old.

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* In Fergusson's work, already alluded to, there is figured a dolmen of Uby, Scandinavia, page 311, and Antiquera, Spain, page 383, which resemble in many features the dolmens near Osaka. Jewitt also, in his work entitled "Grave-Mounds and their Contents," figures the dolmen of New Grange, Meath, Ireland, page 57, and the cairn of Howth, Ireland, page 58, which again recall similar features to those of the dolmens described in this article. In the cairn of Howth the passageway is twenty-seven feet long.

At the same meeting of the Boston Society of Natural History in which I communicated the results embodied in this paper, Professor F. W. Putnam announced the discovery of chambered mounds in America, and communicated the following, which is taken from advance sheets of the "Proceedings" of that Society:

> These chambered mounds are situated in the eastern part of Clay County, Missouri, and form a large group on both sides of the Missouri River. The chambers are, in the three opened by Mr. Curtiss, about eight feet square, and from four and a half to five feet high, each chamber having a passageway several feet in length and two in width, leading from the southern side, and opening on the edge of the mound formed by covering the chamber and passageway with earth. The walls of the chambered passages were about two feet thick, vertical, and well made of stones which were evenly laid, without clay or mortar of any kind. The top of one of the chambers had a covering of large, flat rocks, but the others seem to have been closed over with wood. The chambers were filled with clay which had been burned, and appeared as if it had fallen in from above. The inside walls of the chambers also showed signs of fire. Under the burned clay, in each chamber, were found the remains of several human skeletons, all of which had been burned to such an extent as to leave but small fragments of the bones, which were mixed with the ashes and charcoal. Mr. Curtiss thought that in one chamber he found the remains of five skeletons and in another thirteen. With these skeletons there were a few flint implements and minute fragments of vessels of clay.
>
> A large mound near the chambered mounds was also opened, and in this no chambers were found. Neither had the bodies been burned. This mound proved remarkably rich in large flint implements, and also contained well-made pottery, and a peculiar "gorget" of red stone. The connection of the people who placed the ashes of their dead in the stone chambers with those who buried their dead in the earth-mounds is, of course, yet to be determined.

E. G. Stillman
1917

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THE

POPULAR SCIENCE
MONTHLY.

JANUARY, 1879.

TRACES OF AN EARLY RACE IN JAPAN.

BY EDWARD S. MORSE.

THERE is no race of people in whose origin we are more interested than in that of the Japanese. Their history going so completely back for nearly two thousand years, their civilization, which in so many respects parallels our own—the various epochs in our history being typified again and again by similar ages in Japan—all excite our deepest interest. The difficulty of tracing out ethnical affinities either through their personal peculiarities or their language presents a problem yet unsolved. That they are a composite race we cannot doubt. All their traditions point to their coming from the south, and equally sure are we that when they landed they found a hairy race of men to contest their occupation. Later history shows that a number of Chinese invasions took place, and these unwelcome visits were returned by the Japanese. Corea was invaded by the Japanese long ago. With these facts in mind, we are no longer surprised at the great variety of faces to be met with in Japan—faces purely Chinese; others with the coarser features of the northern tribes; and again the delicate and pleasant features of what is supposed to represent the typical Japanese.

The conjectures and opinions that have been advanced regarding the origin of the Japanese would form a curious and bulky collection. It is worth noting that both pagan and Christian writers have held almost equally preposterous notions regarding the origin of the Japanese. The people themselves have a tradition that they owe their origin to the sun. Kämpfer holds the absurd idea that "they are descended from the first inhabitants of Babylon." From these vagaries we pass in turn to other ideas based on some foundation of fact. In a paper read before the Asiatic Society of Japan by Mr. Aston, an affinity is

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shown to exist between certain words in the Japanese and Aryan; while Mr. Brooks, in the proceedings of the California Academy of Sciences, takes ground for believing that the Japanese and Chinese may have been derived from the west coast of South America. Mr. Isawa, an intelligent Japanese student, at the last meeting of the American Association for the Advancement of Science, called attention to the similarity existing between many Japanese words and Hindostanee. With these and many other conflicting views, authorities seem to agree upon one thing, and that is, that the present inhabitants of Japan are not autochthonous, neither the Japanese nor the Ainos in Yesso.

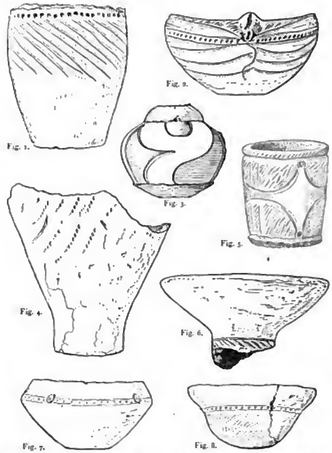
Fig. 1.
Fig. 2.
Fig. 3.
Fig. 4.
Fig. 5.
Fig. 6.
Fig. 7.
Fig. 8.

Figs. 1 to 9 show some of the various forms of vessels. Fig. 1, diameter, 130 mm. Fig. 2, diameter, 240 mm. Fig. 3, diameter, 130 mm. Fig. 4, height, 220 mm. Fig. 5, diameter, 105 mm. Fig. 6, diameter, 160 mm. Fig. 7, diameter, 150 mm. Fig. 8, diameter, 150 mm.

So far as the ancient records of Japan are to be relied upon (and they certainly go back before the Christian era with considerable accuracy), Jimmu Tenno in the first century of our era came from a province in Kiushiu for the conquest of Niphon or Japan. The invaders met with so courageous a resistance that they were obliged to go back to their own shores. The people who repulsed Jimmu Tenno and his followers are believed by the Japanese to have been the hairy men of Yesso, the ancestors of the present inhabitants of the northern islands.

The study of the language, traditions, and folk-lore of the Ainos, furnishes good reasons for believing that the ancestors of the Ainos came from Kamtchatka, drifting down through the Kuriles, and gradually becoming proprietors of the soil before the Japanese came from the south to displace them.

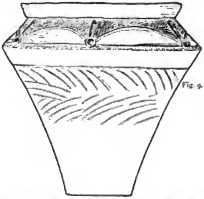

Fig 9—the rims of this vessel are quite common in the heaps, but only one, the fragments of which could be matched, was found. Its height was about 300 mm.

With every reason for believing that the Japanese came from the south, displacing the Ainos, who came from the north, the question next arises as to the original occupants of the island. Did the northern people encounter resistance from a primitive race of savages, or were they greeted only by the chattering of relatives still more remote, whose descendants yet clamber about the forest-trees to-day? The records are silent on these points. A discovery that I made in the vicinity of Tokio last year leads me to believe that possibly the traces of a race of men previous to the Aino occupation have been found. I say possibly, because a study of the Aino people, their manners, and traces of their early remains, is necessary before a definite opinion can be formed.

On my first visit to Tokio I discovered from the car-window a genuine "Kjoekkenmoedding," or shell-heap, as we call them. The deposit is in Omori, about six miles from Tokio; and one may well wonder why it had not been recognized before. It had probably often

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been seen, but, like many similar deposits in Europe and America, had been looked upon as natural beds of sea-shells deposited in past times, and after their formation elevated by upheaval. It was not until Steenstrup, of Copenhagen, first took up the critical study of similar deposits along the shores of the Baltic, and showed that the deposits were really the work of man, and of ancient man, that attention was attracted to these beds in other parts of the world.

Thanks to several years' study of these deposits along the coast of New England, in company with Prof. Jeffries Wyman, I was enabled to recognize the character of the Omori deposit at once. The railway passes directly through it, and most of it has been removed for ballasting the road. The bed evidently covered the field beyond the track for a considerable distance, judging from the quantity of shells and fragments of pottery which were strewed in the adjacent rice-field. The deposit varied from a few inches to two feet and a half in thickness, and the layer of earth above varied from two feet to nearly five feet in thickness. This great depth of soil above the shells might have been brought in by man, as the Japanese are famous for the manner in which they level the ground and fill in depressions. The thickness of soil above a deposit is always an untrustworthy guide in estimating the age of such a deposit: as, for example, the deposits about Salem, Massachusetts, containing precisely the same kinds of pottery and bone-implements, and presumably of the same age, will have in one place a thickness of two feet of soil above, and in the sterile pastures a thin layer of a few inches. The Omori deposit is made up of shells which still live in the bay of Yeddo, though I have not yet been able to study the living forms sufficiently to ascertain whether any changes have taken place in the fauna since the heaps were made. A number of genera are found, representing, among others, *Eburna*, *Turbo*, *Ceritheum Arca*, *Pecten cardium*, two species of *Ostrea*, and, curiously enough, large valves of the common clam, *Mya arenaria*, hardly to be distinguished from the same species so common along the New England coast. The position of the Omori heap is striking. The shell-heaps of New England, Florida, and nearly all places where they have been observed, are always in immediate proximity to the shore or river. In some places, as at Goose Island, Maine, the ocean encroaches upon the deposits and is gradually removing them. Rev. James Fowler, in commenting upon the absence of shell-heaps along the New Brunswick coast, offers this as one of the evidences that the sea is encroaching upon the land, and calls attention to the fact that buildings, which stood at some distance from the shore fifty years ago, have since been washed away.[1] Along the shores of the Baltic, the shell-heaps, on the contrary, are a mile or more from the shore, and this fact, with evidences of a geological character, shows a practical encroachment of the land upon the sea by upheaval since the deposits were made.

The Omori deposits, like those of the Baltic, are some distance from the sea-shore—nearly, if not quite, half a mile. And that an upheaval has taken place since the deposits were made, there can be no doubt. Geological evidences are not wanting to support this view; these various deposits, remote from each other, such as the Denmark, New England, and Florida deposits, have each their peculiarities. In the Danish heaps there seems to be a scarcity of pottery, but an abundance of flint-chips and rude stone implements, as well as implements worked out of horn and bone. The New England shell-heaps are not rich in pottery fragments, the stone implements are rude and scarce, but the implements of horn and bone are comparatively not uncommon, those worked out of bone being more common. In the Florida deposits fragments of pottery are more abundant; and while rude stone and bone implements are found, the larger shells seem to have furnished them with material for many of their implements. Prof. Wyman has figured many of them in his memoir on the fresh-water shell-heaps of Florida, and Dr. Stimpson has figured an awl in the *American Naturalist*, which was made out of the spirally grooved columella of *Fasciolaria*. While the pottery of Denmark and New England is ornamented by incised lines and "cord-marks," the Florida pottery bears the marks of stamps by which they impressed a rude ornamentation upon their vessels. The Omori shell-heap has also its peculiarities: 1. The extreme abundance of pottery, both in fragments and nearly perfect vessels. From the great quantity found there, one is led to believe that in past times it was a famous place for its manufacture. Yet in the excavations no masses or unfinished vessels were found to justify this assumption. 2. The great variety in the form of the vessels and remarkable diversity in their ornamentation. From these characters alone one might infer it to be of more recent origin. Its rudeness, however, and the absence of anything like lathe-work or glazing, show it to be ancient.[1] A greater portion of the pottery has the twisted cord-mark so common in most of the early pottery. Much of it has incised lines, and small fragments show a peculiar carving, made after the clay was dry, but before baking.

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[1] "Smithsonian Annual Report" for 1870, p. 389.

The ornamentation in these fragments is almost precisely similar to the Aino style of ornamenting. In other pottery also the peculiar way in which spaces between curved lines are "filled in," either by "cord-marks" or punctures, again recalls the Aino. And had nothing else been found in the deposit, the remains might have unhesitatingly been referred to the Yessoines. Such comparisons are unsafe, as Mr. Frank H. Cushing, of the Smithsonian Institution, finds similar pottery

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[1] A writer in one of the Yokohama papers calls attention to the fact that a fragment of glazed pottery was found, when the excavations were first made, against the exposed bank of the railway. He might have added that an English button and the soldered disk of a tin preserving-can were also found! Such a one, finding a living toad in a granitic crevice, would be likely to infer, either that the toad was as old as the granite, or that the granite was as recent as the toad.

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in Northern New York and Canada, and I may add that in New England such pottery has been found. In many cases the borders of vessels are ornamented with undulating ribs, showing the marks of "finger-squeezing." A marked peculiarity of the pottery consists in the elevation of the rim or border into ornamented knobs or handles, some of which are represented in Figs. 10 to 17 inclusive. Some painted pottery was also found, the coloring matter of which, on analysis by Prof. Jewett, of the Imperial University of Tokio, proves to be cinnabar. The

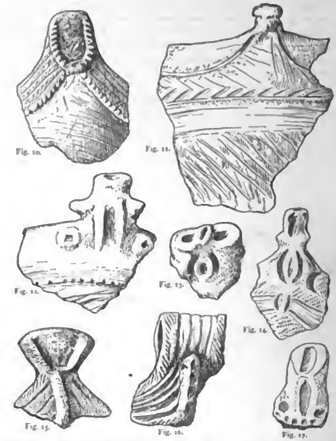
Fig. 10.
Fig. 11.
Fig. 12.
Fig. 13.
Fig. 14.
Fig. 15.
Fig. 16.
Fig. 17.

Figs. 10 to 17 show a few of the knobs or handles which are peculiar to the Omori deposit. Not a single vessel was found with legs, as with the Central American pottery, but most of the vessels have raised knobs on the margin. Fig. 16 is looped, so that a wooden handle might be adjusted. Fig. 11 is 150 mm. in its longest diameter; the size of the other knobs may be estimated from this.

occurrence throughout the empire of stone celts, finished arrow-heads, and spear-points and pestles, is common. These might or might not have belonged to the Ainos, though, as similar forms occur in Yesso, the probability is that many of them at least are of early Aino manufacture. It is significant, however, to observe that the few stone implements found in the Omori beds are of the rudest manufacture; and, furthermore, that no shell-heap that I know of has revealed a less number, the two shown in Figs. 28 and 29 being made of a soft volcanic rock. Curiously enough, most of the other implements were made out of deer's-horns, only one being of bone (Fig. 21, evidently the end of a deer's metatarsal). An exquisitely finished arrow-point (Fig. 25) was fabricated out of a boar's tusk.

The bones of birds were not common. I searched in vain for traces of the great auk, the remains of which are so widely met with in Denmark and New England. Though ponderous shells of various species occur in the heap, no evidence was found that these were worked in any way.

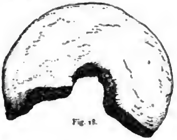
Fig. 18.

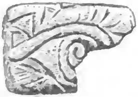
Fig. 19.

Fig. 18 is a piece of pottery that may be a spindle-whorl—diameter, 70 mm.
Fig. 19 is a small clay brick, 55 mm. in length. This is ornamented on both sides. It is difficult to conjecture its use. I have four more in the collection at the university, much larger and ornamented in a different manner. These are possibly amulets, or perhaps signs of office or authority. I think they are unique.

A fragment of a spindle-whorl is shown in Fig. 18. A peculiar tablet, or brick of clay, curiously ornamented, is shown in Fig. 19. Nothing of the kind, so far as I know, has been found in the shell-heaps of other parts of the world. It is difficult even to conjecture its use.

The most important discoveries connected with the Omori deposits are the unquestionable evidences of cannibalism. Large fragments of the human femur, humerus, radius, ulna, lower jaw, and parietal bone, were found widely scattered in the heap. These were broken in precisely the same manner as the deer-bones—either to get them into the cooking-vessel, or for the purpose of extracting the marrow—in all respects corresponding to the facts cited by Wyman in proof of the evidences of cannibalism found in the Florida and New England shell-heaps.

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The question as to the antiquity of the Omori deposits naturally arises, and the evidences all point to a considerable antiquity, suggested by the entire absence of worked metals, as well as of finished or polished stone implements, the few implements found being of the rudest character.

The change which has taken place in the coast-line by upheaval, since the deposits were made, has not the importance which would be ascribed to it in a more stable country.

The next question arises as to whether the deposits are Aino or pre-Aino. The race who left these remains were pot-makers *par excellence.* It is generally admitted by ethnologists that the art of pottery once gained is never lost. It is a fact, however, that neither the Esquimaux, Aleutians, Kamtchadales, nor the Ainos, are essentially earthen-pot makers, their vessels being usually wrought out of stone or wood, and their ancient stone vessels are often met with in various parts of Japan.

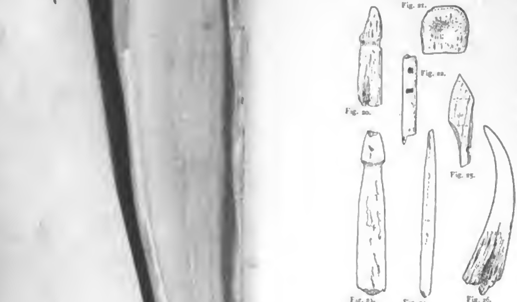
Fig. 20.
Fig. 21.
Fig. 22.
Fig. 23.
Fig. 24.
Fig. 25.
Fig. 26.

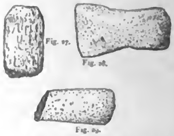
Fig. 27.
Fig. 28.
Fig. 29.

Figs. 20 to 26 represent a number of implements made out of horn, with the exception of Fig. 25, which is worked out of a boar's tusk. Figs. 23, 24, and 26, are respectively 60, 62, and 125 mm. in length. Fig. 21 is worked out of the end of a deer's metatarsal. Fig. 22 is a bird's bone, probably a humerus, with two holes worked in it.

Fig. 27 is a portion of deer's antler cut at both ends and broken,

Figs. 28 and 29 are two stone implements, worked out of soft lava-rock. They are respectively 50 and 70 mm. in length.

If the unquestionable resemblance between the ornamentation of some of the fragments and similar styles of ornamentation among the present Ainos be looked upon as indicating a community of origin, what shall be said of the following figures of knobs found in a shell-heap on the Upper Amazon by the lamented Prof. Hartt? The knobs themselves are so unlike anything figured heretofore, and yet so precisely do they resemble similar knobs which are most common in the Omori deposits, that were they mixed with the collection it would be impossible to separate them by a single character!—even to the depression on top and in front, as shown in Fig. 12.

A curious stone ornament, having the general shape of a comma, with the big end perforated, is known as the *magatama.* These peculiar-shaped objects are looked upon as ornaments belonging to the primitive inhabitants of Japan. Mr. Borlase[1] says the traditions about them have been handed down from mythological times.

Siebold says: "To this day they are in use among the Ainos of Yesso and in the Kuriles, as precious ornaments, under the name of *sitogi.* The inhabitants, too, of Liukiu wear a stone resembling the *magatama;* so that this little jewel helps us to a noteworthy historic fact, namely, to the connection which in remote times existed between the inhabitants of the whole chain of islands from Taiwan to Kamtchatka."

An exhaustive examination of the Omori deposits did not reveal anything like a *magatama.*

Were the Ainos cannibals?

Repeated inquiries among eminent Japanese scholars and archæologists, like Mr. Kanda, Mr. Ninagawa, and others, as to this question, are always answered in the same way. Not only were they not cannibals, but they are reported as being so mild and gentle that murder was never known to have occurred. So monstrous a habit would certainly have been known and recorded, particularly in the painstaking annals of early historians.

In conclusion, then, the Omori shell-heap presents all the leading characteristics of the typical Kjoekkenmoedding. And the evidences which Prof. Wyman cites as evidence of cannibalism, in the shell-heaps of Florida and Massachusetts, are likewise present in the Omori deposit. The recent occupation of America by the white race renders it difficult to determine how recent the shell-heaps along the coast may be, since the savages when first encountered were living in much the same condition as their ancestors had lived, just as to-day there still exist in some parts of the world veritable Stone-age savages. In Japan, however, where historians have chronicled with remarkable fidelity the minute details of their history, we get, as it were, some standard for

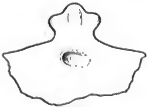

Fig. 30.

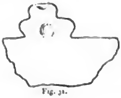

Fig. 31.

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[1] "Niphon and its Antiquities."

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time in estimating the age of the Omori deposits. It can be stated with absolute certainty that they are pre-Japanese; and there are as good reasons for believing them pre-Aino as early Aino.

I have to return my sincere thanks to the university authorities for the zeal they have displayed in assisting me in the examination of the deposits, and to the personal help afforded me in the excavations by Profs. Yatabe, Toyama, and Dr. David Murray, Messrs. Matsumura, Sasaki, Matsura, Fukuyo, and others. I made a special request that the deposits should be completely examined during my absence, and this examination was most faithfully done. A much larger collection was made with many new and curious forms of pots. I hope at some future time to illustrate them.

VIRCHOW AND EVOLUTION.[1]

By Professor JOHN TYNDALL.

THIS world of ours has, on the whole, been an inclement region for the growth of natural truth; but it may be that the plant is all the hardier for the bendings and buffetings it has undergone. The torturing of a shrub, within certain limits, strengthens it. Through the struggles and passions of the brute, man reaches his estate; through savagery and barbarism his civilization; and through illusion and persecution his knowledge of Nature, including that of his own frame. The bias toward natural truth must have been strong to have withstood and overcome the opposing forces. Feeling appeared in the world before knowledge; and thoughts, conceptions, and creeds, founded on emotion, had, before the dawn of science, taken root in man. Such thoughts, conceptions, and creeds, must have met a deep and general want; otherwise their growth could not have been so luxuriant, nor their abiding power so strong. This general need—this hunger for the ideal and wonderful—led eventually to the differentiation of a caste, whose vocation it was to cultivate the mystery of life and its surroundings, and to give shape, name, and habitation to the emotions which that mystery aroused. Even the savage lived, not by bread alone, but in a mental world peopled with forms answering to his capacities and needs. As time advanced—in other words, as the savage opened out into civilized man—these forms were purified and ennobled, until they finally emerged in the mythology and art of Greece:

> "Where still the magic robe of Poesy
> Wound itself lovingly around the Truth."[2]

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[1] Introductory chapter to a forthcoming volume of "Fragments of Science."

[2] "Da der Dichtung zauberische Hülle
Sich noch lieblich um die Wahrheit wand."—Schiller.

by Google

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PRIMEVAL JAPANESE.

BY

CAPT. F. BRINKLEY.

FROM THE SMITHSONIAN REPORT FOR 1903, PAGES 793-804.

(No. 1537.)

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
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PRIMEVAL JAPANESE.[a]

By Capt. F. BRINKLEY.

There are three written records of Japan's early history. The oldest[b] of them dates from the beginning of the eighth century of the Christian era, and deals with events extending back for fourteen hundred years. The compilation of this work was one of the most extraordinary feats ever undertaken. The compiler had to construct the sounds of his own tongue by means of ideographs devised for transcribing a foreign language. He had to render Japanese phonetically by using Chinese ideographs. It was as though a man should set himself to commit Shakespeare's plays to writing by the aid of the cuneiform characters of Babylon. A book composed in the face of such difficulties could not convey a very clear idea of contemporary speech or thought. The same is true, though in a less degree, of the other two[c] volumes on which it is necessary to rely for knowledge of ancient Japan.

It might reasonably be anticipated, arguing from the analogy of other nations, that some plain practical theory would exist among the Japanese as to their own origin; that tradition would have supplied for them a proud creed identifying their forefathers with some of the renowned peoples of the earth, and that if the progenitors of the nimble-witted, active-bodied, refined, and high spirited people now bidding so earnestly for a place in the comity of great nations had migrated originally from a land peopled by men possessing qualities, such as they themselves have for centuries displayed, many annals descriptive of their primeval home would have been handed down through the ages. There are no such theories, no such annals, no such traditions.

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[b] The Koji-ki, or annals of ancient matters.

[c] The Nihon-gi (history of Japan) and the Koga-shu (ancient records).

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When the Japanese first undertook to explain their own origi
in the three books spoken of above, so unfettered were they by genuin
reminiscences that they immediately had recourse to the supernatur
and derived themselves from heaven. Reduced to its fundamenta
outlines, the legend they set down was that, in the earliest times,
group of the divine dwellers in the plains of high heaven descended to
place with a now unidentifiable name, and thence gradually pushin
eastward, established themselves in the "land of sunrise," giving t
it a race of monarchs, direct scions of the goddess of light (Amate
rasu). Many things are related about these heaven-sent folk wh
peopled Japan hundreds of years before the Christian era. They ar
things that must be studied by any one desiring to make himsel
acquainted with the essence of her indigenous religion or her pictoria
and decorative arts, for they there play a picturesque and prominen
part. But they have nothing to do with sober history. Possibly it ma
be urged that nations whose traditions deal with a Mount Sinai, a pil
lar of cloud and fire, and an immaculate conception, have no right t
reject everything supernatural in oriental annals. That superficia
retort has, indeed, been made too often. But behind it there undoubt
edly lurks in the inner consciousness of the educated and intelligen
Japanese a resolve not to scrutinize these things too closely. Whethe
or not the "age of the gods"—kami no yo—of which, as a child, h
reads with implicit credence, and of which, as a man, he recognize
the political uses, should be openly relegated to the limbo of absurd
ities; whether the deities had to take part in an immodest dance i
order to lure the offended sun goddess from a cave to which he
brother's rudeness had driven her, thus plunging the universe in dark
ness; whether the god of impulse fought with the god of fire on th
shores of the Island of Nine Provinces; whether the procreative divini
ties were inspired by a bird; whether the germs of a new civilizatio
were carried across the sea by a prince begotten of the sunshine an
born in the shape of a crimson jewel—these are not problems tha
receive very serious consideration in Japan, though neither a Colens
nor a Huxley has yet arisen to attack them publicly. They a
rather allegories from which emerges the serviceable political do
trine that the Emperors of Japan, being of divine origin, rule b
divine right. It is the Japanese historian's method, or the Japanes
mythologist's manner, of describing an attribute claimed until ve
recently by all occidental sovereigns, and still asserted on behalf
some. As for the foreign student of Japan's ancient history, the
weird myths and romantic allegories have induced him to dismiss it
a purely imaginary product of later-day imagination. The transce
dental elements woven into parts of the narrative discredit the wh
in his eyes. And his scepticism is fortified by a generally-accept
hypothesis that the events of the thirteen opening centuries of t

story were preserved solely by oral tradition. The three volumes which profess to tell about the primeval creators of Japan, about Jimmu, the first mortal ruler, and about his human successors during a dozen centuries, are supposed to be a collection of previously unwritten recollections, and it seems only logical to doubt whether the outlines of figures standing at the end of such a long avenue of hearsay can be anything but imaginary. Possibly that disbelief is too wholesale; possibly it is too much to conclude that the Japanese had no kind of writing prior to their acquisition of Chinese ideographs in the fifth century of the Christian era. But there is little apparent hope that the student will ever be in a position to decide these questions conclusively. He must be content for the present to regard the annals of primeval Japan as an assemblage of heterogeneous fragments from the traditions of South Sea Islanders, of Central Asian tribes, of Manchurian Tartars, and of Siberian savages, who reached her shores at various epochs, sometimes drifted by ocean currents, sometimes crossing by ice-built bridges, sometimes migrating by less fortuitous routes.

What these records, stripped of all their fabulous features, have to tell is this:

At a remote date a certain race of highly-civilized men—highly civilized by comparison—arrived at the islands of Japan. Migrating from the south, the adventurers landed on the southern island, Kiushiu, and found a fair country covered with luxurious vegetation and sparsely populated by savages living like beasts of the field, having no organized system of administration and incapable of offering permanent resistance to the superior weapons and discipline of the invaders, who established themselves with little difficulty in the newly-found land. But on the main island two races of men very different from these savages had already gained a footing. One had its headquarters in the province of Izumo and claimed sovereignty over the whole country. The other was concentrated in Yamato. Neither of these races knew of the other's existence, Izumo and Yamato being far apart. At the outset the immigrants who had newly arrived in Kiushiu imagined that they had to deal with the Izumo folk only. They began by sending envoys. The first of these, bribed by the Izumo rulers, made his home in the land he had been sent to spy out. The second forgot his duty in the arms of an Izumo beauty whose hair fell to her ankles. The third discharged his mission faithfully, but was put to death in Izumo. The sequel of this somewhat commonplace series of events was war. Putting forth their full strength, the southern invaders shattered the power of the Izumo court and received its submission. But they did not transfer their own court to the conquered province. Ignorant that Izumo was a mere fraction of the main island, they imagined that no more regions remained to be subjugated. By and by they discovered their mistake. Intelligence reached them that far

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away in the northeast a race of highly-civilized men, who had originally come from beyond the sea in ships, were settled in the province of Yamato, holding undisputed sway. To the conquest of these colonists Jimmu, who then ruled the southern immigrants, set out on a campaign which lasted fifteen years and ended, after some fierce fighting in the Yamato ruler's acknowledging their consanguinity with the invader and abdicating in his favor.

Whether Jimmu's story be purely a figment of later-day imagination, or whether it consists of poetically embellished facts, there ca be no question about its interest, since it shows the kind of hero tha subsequent generations were disposed to picture as the founder of the sacred dynasty, the chief of the Japanese race. The youngest of fou sons, he was nevertheless selected by his "divine" father to succee to the rulership of the little colony of immigrants then settled i Kiushiu, and his elder brothers obediently recognized this right of choice. He was not then called "Jimmu;" that is his posthumus name. Sanu, or Hiko Hohodemi, was his appellation, and he is represented in the light of a kind of viking. Learning of Yamato and its rulers from a traveler who visited Kiushiu, he embarked all his available forces in war vessels and set out upon a tour of aggression. Creeping along the eastern shore of Kiushiu, and finally entering the Inland Sea, the adventurers fought their way from point to point, landing sometimes to do battle with native tribes, sometimes to construct new war junks, until, after fifteen years of fighting and wandering, they finally emerged from the northern end of the Inland Sea and established themselves in Yamato, destined to be thenceforth the imperial province of Japan. In this long series of campaigns the chieftain lost his three brothers. One fell in fight; two threw themselves into the sea to calm a tempest that threatened to destroy the flotilla. Such are the deaths that Japanese in all ages have regarde as ideal exits from this mortal scene—deaths by the sword and death of loyal self sacrifice. To the leader himself, after his decease, the posthumous name of Jimmu, or "the man of divine bravery," was given, typifying the honor that has always attached to the professio of arms in Japan. The distance from this primitive viking's starting point to the place where he established his capital and consummate his career of conquest can easily be traversed by a modern steamer i twice as many hours as the number of years devoted by Jimmu an his followers to the task. That the craft in which they traveled wer of the most inefficient type may be gathered from the fact that th viking's progress eastward would have been finally interrupted by th narrow strip of water dividing Kiushiu from the main island of Japa had not a fisherman seated on a turtle emboldened him to strike sea ward. Thenceforth the turtle assumed a leading place in the mytho ogy of Japan—the type of longevity, the messenger of the marin deity, who dwelt in the crystal depths of the ocean, his palace peopled by lovely maidens. The goddess of the sun shone on Jimmu's enterprise at times when tempest or fog threatened serious peril, and a kite, circling overhead, indicated the direction of inhabited districts when he and his warriors had lost their way among mountains and forests.

How much of all this was transmitted by tradition, written or oral, to the compilers of Jimmu's history in the eighth century; how much was a mere reflection of national customs which had then become sacred, and on which the political scholars of the time desired to set the seal of antique sanction, who shall determine? If Susa and his warriors brought with them the worship of the sun, that would offer an interesting inference as to their origin. If the aid that they received from his light was suggested solely by the grateful homage that rice cultivators, thirteen centuries later, had learned to pay to his beneficence, then the oldest written records of Japan must be read as mere transcripts of the faiths and fashions of the era when they were compiled, not as genuine traditions transmitted from previous ages. But such distinctions have never been recognized by the Japanese. With them these annals of their race's beginnings have always commanded as inviolable credence as the Testaments of Christianity used to command in the Occident. From the lithographs that embellish modern bank notes the sun looks down on the semidivine conqueror, Jimmu, and receives his homage. From the grand cordon of an order instituted by his hundred and twenty seventh successor depends the kite that guided him through mountain fastnesses, and on a thousand works of art the genius of the tortoise shows him the path across the ocean. If these picturesque elements were added by subsequent writers to the outlines of an ordinary armed invasion by foreign adventurers, the nation has received them and cherishes them to this day as articles of a sacred faith.

The annals here briefly summarized reveal three tides of more or less civilized immigrants and a race of semibarbarous autochthons. All the learned researches of modern archæologists and ethnologists do not teach us much more. It is now known with tolerable certainty that the so-called autochthons were composed of two swarms of colonists, both coming from Siberia, though their advents were separated by a long interval.

The first, archeologically indicated by pit dwellings and shell mounds still extant, were the Koro-pok-guru, or "cave men." They are believed to be represented to-day by the inhabitants of Saghalien, the Kuriles, and southern Kamschatka.

The second were the Ainu, a flat-faced, heavy-jawed, hirsute people, who completely drove out their predecessors and took possession of the land. The Ainu of that period had much in common with animals. They burrowed in the ground for shelter; they recognized no distinc-

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tion of sex in apparel or of consanguinity in intercourse; they clad themselves in skins; they drank blood; they practiced cannibalism; they were insensible to benefits and perpetually resentful of injuries; they resorted to savagely cruel forms of punishment—severing the tendons of the legs, boiling the arms, slicing off the nose, etc.; they used stone implements, and, unceasingly resisting the civilized immigrants who subsequently reached the islands, they were driven northward by degrees, and finally pushed across the Tsugaru Strait into the island of Yezo. That long struggle, and the disasters and sufferings it entailed, radically changed the nature of the Ainu. They became timid, gentle, submissive folk; lost most of the faculties essential to survival in a racial contest, and dwindled to a mere remnant of semi-savages, incapable of progress, indifferent to improvement, and presenting a more and more vivid contrast to the energetic, intelligent, and ambitious Japanese.

But these Japanese—who were they originally? Whence did the three or more tides of immigration set which ultimately coalesced to form the race now standing at the head of Oriental peoples? Strangely varying answers to this question have been furnished. Kampfer persuaded himself that the primeval Japanese were a section of the builders of the Tower of Babel. Hyde-Clarke identified them with Turano-Africans who traveled eastward through Egypt, China, and Japan. Macleod recognized in them one of the lost tribes of Israel. Several writers have regarded them as Malayan colonists. Griffin was content to think that they are modern Ainu, and recent scholars incline to the belief that they belonged to the Tartar-Mongolian stock of Central Asia. Something of this diversity of view is due to the fact that the Japanese are not a pure race. They present several easily distinguishable types, notably the patrician and the plebeian. This is not a question of mere coarseness in contrast with refinement; of the degeneration due to toil and exposure as compared with the improvement produced by gentle living and mental culture. The representative of the Japanese plebs has a conspicuously dark skin, prominent cheek bones, a large mouth, a robust and heavily boned physique, a flat nose, full straight eyes, and a receding forehead. The aristocratic type is symmetrically and delicately built; his complexion varies from yellow to almost pure white; his eyes are narrow, set obliquely to the nose; the eyelids heavy; the eyebrows lofty; the mouth small; the face oval; the nose aquiline; the hand remarkably slender and supple.

Here are two radically distinct types. What is more, they have been distinguished by the Japanese themselves ever since any method of recording such distinctions existed. For from the time when he first began to paint pictures, the Japanese artist recognized and represented only one type of male and female beauty—namely, that distinguished in a marked, often an exaggerated, degree by the features enumerated above as belonging to the patrician class. There has been no evolution in this matter. The painter had as clear a conception of his type ten centuries ago as he has to-day. Nothing seems more natural than the supposition that this higher type represents the finally dominant race of immigrants; the lower, their less civilized opponents.

The theory which seems to fit the facts best is that the Japanese are compounded of elements from Central and Southern Asia, and that they received their patrician type from the former, their plebeian from the latter. The Asiatic colonists arrived via Korea. But they were neither Koreans nor Chinese. That seems certain, though the evidence which proves it can not be detailed here. Chinese and Koreans came from time to time in later ages; came occasionally in great numbers, and were absorbed into the Japanese race, leaving on it some faint traces of the amalgamation. But the original colonists did not set out from either China or Korea. Their birthplace was somewhere in the north of Central Asia. As for the South-Asian immigrants, they were drifted to Japan by a strange current called the "Black Tide" (*Kuro-shiwo*), which sweeps northward from the Philippines, and bending thence toward the east, touches the promontory of Kii and Yamato before shaping its course permanently away from the main island of Japan. It is true that in the chronological order suggested by early history the southern colonists succeeded the northern and are supposed to have gained the mastery; whereas among the Japanese, as we now see them, the supremacy of the northern type appears to have been established for ages. That may be explained, however, by an easy hypothesis—namely, that although the onset of the impetuous southerns proved at first irresistible, they ultimately coalesced with the tribes they had conquered, and in the end the principle of natural selection replaced the vanquished on their proper plane of eminence. But this distinction, it must be observed, is one of outward form rather than of moral attributes. Neither history nor observation furnishes any reason for asserting that the so-called "aristocratic," or Mongoloid, cast of features accompanies a fuller endowment of either physical or mental qualities than the vulgar, or Malayan, cast. Numerically the patrician type constitutes only a small fraction of the nation, and seems to have been lacking in a majority of the country's past leaders, as it is certainly lacking in a majority of her present publicists, and even in the very creme de la creme of society. The male of the upper classes is not generally an attractive product of nature. He has neither commanding stature, refinement of features, nor weight of muscle. On the other hand, among the laboring populations, and especially among the seaside folk, numbers of men are found who, though below the average Anglo-Saxon or Teuton in bulk, are cast in a perfectly symmetrical

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mold and suggest great possibilities of muscular effort and endurance. In short, though the aristocratic type has survived, and though its superior beauty is universally recognized, it has not impressed itsel completely on the nation, and there is no difficulty in conceiving tha its representatives went down before the first rush of the souther invaders, but subsequently, by tenacity of resistance and by fortitude under suffering, recovered from a shock which would have crushed lower grade of humanity.

Histories that describe the manners and customs of a people have been rare in all ages. The compilers of Japan's first annals, in the eighth century, paid little attention to this part of their task. Were it necessary to rely on their narrative solely for a knowledge of the primeval Japanese, the student would be meagerly informed. Bu archæology comes to his assistance. It raises these men of old from their graves, and reveals many particulars of their civilization which could never have been divined from the written records alone.

The ancient Japanese—not the Koro-pok-guru or the Ainu, but the ancestors of the Japanese proper—buried their dead first in barrows and afterwards in dolmens. The barrow was merely a mound of earth heaped over the remains, after the manner of the Chinese. The dolmen was a stone chamber. It had walls constructed with blocks of stone, generally unhewn and rudely laid, but sometimes hewn and carefully fitted; its roof consisted of huge and ponderous slabs. It varied in form—sometimes taking the shape of a long gallery only, sometimes of a gallery and a chamber, and sometimes of a gallery and two chambers. Over it was built a mound of earth which occasionally assumed enormous dimensions, covering a space of 70 or 80 acres, rising to a height of as many feet, and requiring the labor of thousands of workmen. The builders of the barrows were in the bronze age of civilization, the constructors of the dolmens in the iron age. In the barrows are found weapons and implements of bronze and vessels o hand-made pottery; in the dolmens, weapons and implements of iro and vessels of wheel-turned pottery. There is an absolute line o division. No iron weapon nor any machine-made pottery occurs in a barrow, no bronze weapon nor any hand-made pottery in a dolmen. Are the barrow builders and the dolmen constructors to be regarde as distinct races or as men of the same race at different stages of it civilization? Barrow and dolmen bear common testimony to the fac that before the ancestors of the Japanese nation crossed the sea t their inland home they had already emerged from the stone age, f neither in barrow nor in dolmen have stone weapons or implements bee found, though these abound in the shell heaps and kitchen middens tha constitute the relics of the Koro-pok-guru and the Ainu. But, on th other hand, barrow and dolmen introduce their explorer to peopl who stood on different planes of industrial development.

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The progress of civilization is always gradual. A nation does not pass, in one stride, from burial in rude tumuli to sepulture in highly specialized forms of stone vaults, nor yet from a bronze age to an iron. It is therefore evident that the evolution of dolmen from barrow did not take place within Japan. The dolmen constructor must have completely emerged from the bronze age and abandoned the fashion of barrow burial before he reached Japan. Otherwise search would certainly disclose some transitional form between the barrow and the dolmen, and some iron implements would occur in the barrows or bronze weapons in the dolmens. If, then, the barrow builder and the dolmen constructor were racially identical, it would seem to follow that the latter succeeded the former by a long interval in the order of immigration and brought with him a greatly improved type of civilization evolved in the country of his origin.

The reader will be naturally disposed to anticipate that the geographical distribution of the dolmens and the barrows furnishes some aid in solving this problem. But though the exceptional number found on the coasts opposite to Korea tends to support the theory that the stream of Mongoloid immigration came chiefly from the Korean Peninsula via the island of Tsushima, there is not any local differentiation of one kind of sepulture from the other, and, for the rest, the grouping of the dolmens supplies no information except that their builders occupied the tract of country from the shores opposite Korea on the west to Musashi and the south of Shimotsuke on the east, and did not penetrate to the extreme northeast or to the regions of mountain and forest in the interior.

Here another point suggests itself. If the fashion of the Japanese dolmen was introduced from abroad, evidences of its prototype should survive on the adjacent continent of Asia. If the numerous dolmens found on the coasts of Kiushiu and Izumo facing Korea are to be taken as indications that their constructors emigrated originally from the Korean Peninsula, then Korea also should contain similar dolmens, and if an ethnological connection existed between Japan and China in prehistoric days, China, too, should have dolmens. But no dolmens have hitherto been found in China, and the dolmens of Korea differ radically from those of Japan, being "merely cists with megalithic capstones" (Gowland). It has been shown, further, that dolmens similar to those of Japan are not to be found in any part of continental Asia eastward of the shores of the Caspian Sea, and that western Europe alone offers exactly analogous types. In short, from an ethnological point of view, the dolmens of Japan are as perplexing as the dolmens of Europe, and the prospect of solving the riddle seems to be equally remote in both cases. All that can be affirmed is that the dolmens offer strong corroborative testimony to the truth of the Japanese historical narrative which represents Jimmu as the leader of the last and

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most highly civilized among the bands of colonists constituting the ancestors of the present Japanese race. Thus the "divine warrior," after having been temporarily erased from the tablets of history by the modern sceptic of the West, is projected upon them once more from the newly opened graves of the primeval Japanese. It is true that there is an arithmetical difficulty. It has been supposed that the dolmens do not date from a period more remote than the third century before Christ, whereas Jimmu's invasion is assigned to the seventh. But no great effort of imagination is required to effect a compromise between the uncertain chronology of the Japanese annals and the tentative estimates of modern archeologists.

Some of the burial customs revealed by these ancient tombs resemble the habits of the Scythians as described by Herodotus. The Japanese did not, it is true, lay the corpse of a chieftain between sheets of gold, nor did they inter his favorite wife with similar pomp in an adjoining chamber; but they did deposit with him his weapons, his ornaments, and the trappings of his war horse, and in remote times they followed the barbarous rule of burying alive, in the immediate vicinity of his sepulcher, his personal attendants, male and female, and probably also his steed. To the abrogation of that cruel rule is due much information about the garments worn in early epochs, for in the century immediately preceding the Christian era a kind-hearted emperor decided that clay figures should be substituted for human victims, and these figures, being modeled, however roughly, in the guise of the men and women of the time, tell what kind of costumes were worn and what was the manner of wearing them. Collecting all the available evidence, the story shapes itself into this:

Prior to the third, or perhaps the fourth century before the Christian era, when the dead were interred in barrows, not dolmens, the Japanese, though they stood on a plane considerably above the general level of Asiatic civilization, did not yet understand the forging of iron or the use of the potter's wheel. They were still in the bronze age, and their weapons—swords, halberds, and arrowheads—were made of that metal. Concerning the fashion of their garments not much is known, but they used for purpose of personal adornment, quaintly shaped objects of jasper, rock crystal, steatite, and other stones. Then, owing probably to the advent of a second wave of immigration from the continent, the civilization of the nation was suddenly raised, and the country passed at once from the bronze to the iron age, with a corresponding development of industrial capacity in other directions, and with a novel method of sepulture having no exact prototype except in western Europe. The newcomers seem to have been, not a race distinct from their predecessors, but a second outgrowth of colonists from the same parent stem. Where that stem has its roots there is no clear indication, but it is evident that, during the interval between the first and the second migrations, the mother country had far excelled its colony in material civilization, so that, with the advent of the second band of wanderers, the condition of the Japanese underwent marked change. They laid aside their bronze weapons and began to use iron swords and spears, and iron-tipped arrows. A warrior carried one sword and, perhaps, a dagger. The sword had a blade which varied from 2½ feet to over 3 feet in length. These were not the curved weapons with curiously modeled faces and wonderful trenchancy which became so celebrated in later times. Straight, one-edged swords, formidable enough, but considerably inferior to the admirable katana of medieval and modern eras, they were sheathed in wooden scabbards, having bands and hoops of copper, silver, or iron, by means of which the weapon was suspended from the girdle. The guards were of iron, copper, or bronze, often coated with gold, and always having holes cut in them to render them lighter. Wood was the material used for hilt as well as for scabbard, but generally in the former case and sometimes in the latter a thin sheet of copper with gold plating enveloped the wood. Double barbs characterized the arrowhead, and as these projected about 4 inches beyond the shaft, a bow of great strength must have been used, though of only medium length. Armor does not seem to have been generally worn, or to have served for covering any part of the body, except the head and the breast. It was of iron, and it took the shape of thin bands of metal, riveted together for casque and cuirass. Neither brassart, visor, nor greaves have been found in any dolmen, and though solerets of copper are among the objects exhumed, they appear to have been rather ornamental than defensive. As to shields, nothing is known. No trace of them has been found, and it seems a reasonable inference that they were not used. Horses evidently played an important part in the lives of the second batch of immigrants, for horse furniture constantly appears among the objects found in dolmens. The bit is almost identical with the common "snaffle" of the Occident. Made of iron, it has siderings or cheek pieces of the same metal, elaborately shaped and often sheeted with gilded copper. The saddle was of wood, peaked before and behind and braced with metal bands, and numerous ornaments of repoussé iron covered with sheets of gilt or silvered copper were attached to the trappings. Among these ornaments a peculiar form of bell is present, an oblate hollow sphere, having a long slit in its shell and containing a loose metal pellet. Stirrups are seldom found in the dolmens, and the rare specimens hitherto exhumed bear no resemblance to the large, heavy, shoe-shaped affairs of later ages, but are rather of the Occidental type.

The costume of these ancient Japanese had little in common with that of their modern descendants. They wore an upper garment of woven stuff fashioned after the manner of a loosely fitting tunic, and

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confined at the waist by a girdle, and they had loose trousers reaching nearly to the feet. For ornaments they used necklaces of beads or of rings—silver, stone, or glass; finger rings, sometimes of silver or gold, sometimes of copper, bronze, or iron, plated with one of the precious metals; ring-shaped buttons; metal armlets; bands or plates of gilt copper, which were attached to the tunic; earrings of gold, and tiaras. Not one item in this catalogue, the tiara excepted, appears among the garments or personal ornaments of the Japanese since their history and habits began to be known to the outer world. No nation has undergone a more radical change of taste in the matter of habiliments and adornments. The earring, the necklace, the finger ring, the bracelet, and the band or plate of metal attached to the tunic—all these passed completely out of vogue so long ago that, without the evidence of the contents of the dolmen, it would be impossible to conceive the existence of such things in Japan. One of the most noteworthy features of the people's habits in medieval or modern times is that, with the solitary exception of pins and fillets for the hair, they eschew every class of personal ornament. Yet the dolmens indicate that personal adornments were abundantly, if not profusely, employed by the ancestors of these same Japanese in prehistoric days. Indeed, the only features common to the fashions of the Japanese as they are now known and the Japanese as their sepulchers reveal them are the rich decoration of the sword hilt and scabbard and of the war horse's trappings.

As to the food of these early people, it seems to have consisted of fish, flesh, and cereals. They used wine of some kind, though of its nature there is no knowledge, and their household utensils were of pottery, graceful in outline, but unglazed and archaically decorated. Whether or not they possessed cattle there is no evidence, nor yet is it known what means they employed to produce fire, though the fire drill appears to be the most probable.

That they believed in a future state is evident, since they buried with the dead whatever implements and weapons might be necessary in the life beyond the grave; that ancestral worship constituted an important part of their religious cult is proved by the offerings periodically made at the tombs of the deceased; and that idolatry was not practised or superstition largely prevalent may be deduced from the complete absence of charms or amulets among the remains found in their sepulchers.

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The Chinese weaver in the Ch'ang-i district formerly found a better market for his product in Chefoo; but by reason of the shorter, quicker, cleaner, and cheaper haul to the Tsingtau market, which gives him a better price there, he has recently transferred the bulk of his sales to this port in spite of the higher commissions charged here. Silk which was formerly woven nearer to Chefoo is now sent to the Ch'ang-i district to be woven in order to take advantage of the proximity of the Tsingtau market. The raw-silk market is still controlled in Shanghai. The outside wrappings of the cocoon (waste) are also bought in Shanghai, exported to Bradford, England, made into plush, re-exported to China, and made into native coats.

1913: Oriental Review, Vol. 3.

ARE JAPANESE ARYANS?—William Elliot Griffis, in a letter to the Times, says: "Allow me to add a few brief footnotes to your recent editorial, 'The Japanese Claim Relationship.' As early as 1866 Dr. Albert Smith Bickmore, still living in New York City, I believe, visited the Ainu in Yezo, and, as a man of science, declared them to be white men of the Aryan, or Caucasian race. An American made this discovery, then, over forty years ago. The conclusion of nearly thirty years of scientific investigation by native Japanese men of science is, in Prof. Koganei's verdict—'The Mikado's realm was once an Ainu realm.' My own opinion, after studying scores of the Ainu on the spot, in Tokyo in 1872, and recorded in 'The Mikado's Empire,' 1876, is: That the Ainu once occupied the whole archipelago of Japan. The oldest names of the mountains and rivers are not Japanese, but Ainu. Made up of four of the strong races of mankind, Aryan, Semitic, Malay, and Tartar, there was no such thing as a Japanese nation, (people under one general government, law, language, religion, common interests, etc.,) until 1192 A.D.; and the fusion was not complete until much later. Yezo, or the northern islands, was not, until very late, in the Japanese consciousness. These northern islands were virtually unknown with definiteness until the Russian advance and invasion in the eighteenth century. Hence, the Ainu of Yezo remained separate and unincorporated, with their blood unmingled, as on the main island, where the Ainu were, centuries ago, absorbed in the composite Japanese. Increasing harmony among scholars, archæologists, ethnologists, critical reading of the Kojiki, or ancient records, 712 A.D., all point to the fact that the basic stock of the Japanese of today is Ainu. That is, the Japanese are as much Aryan—whatever that may be—as any other stock, perhaps, on earth. Leaving diplomacy to settle political questions, let us hold to science. After forty-six years' study of the Japanese, I cannot but conceive of them as a non-Mongolian people."

Nos. 7-8: May-June, 1913

THE DUNDEE JUTE TRADE IN 1912.—The year 1912 was one of exceptional prosperity for the Dundee consular district in almost every line of business, and particularly so in the jute industry, upon which the welfare of the district so largely depends. The remarkable revival in the jute trade began toward the latter part of 1911 and continued at an ever-increasing rate throughout 1912. The five years immediately preceding 1912 had been years of extreme depression and many expert, who passes on the grade. In Tsingtau the Chinese agent and the compradore of the foreign firm each receive a 2 per cent. commission; in Chefoo the same commissions are, respectively, 1 per cent. and one-half of 1 per cent.; in Tientsin and Shanghai the commissions are lower because of the increased cost of transportation to these places. Other things being equal, it is evident that Tsingtau, having direct rail communication with the center of manufacture and direct steamship communication with the principal buyers, is in possession of great advantages over neighboring ports, and these advantages have been effectively used. Since October, 1912, when the movement really began, the four largest exporters in Chefoo have transferred their business to Tsingtau. Shanghai's exporters are also represented here, and there have been new entries in the field. The most important developments have occurred since the Chinese New Year. Since that time stocks have not been replenished in Chefoo, and only 4,000 pieces were on hand there the middle of March, in contrast to 30,000 pieces in stock in Tsingtau. The silk expert of the largest exporters in Tsingtau confidently asserts, says Consular and Trade Reports, that by the end of 1913 Tsingtau will be the only important market for the trade.

How Pongee Is Manufactured.—The following details of the process of the manufacture of pongee will indicate another step in the transfer of the trade to Tsingtau. The cocoons arrive in the Nanshan district in October; the chrysalis is killed by dry heat; the cocoons are stored dry for six months or longer, then softened by steam and 8 or 16 unreeled for one thread by each spindle (yield, in a good year, 1,200 to 1,400 yards from each set). The raw silk is transported in hanks by mule to the Ch'ang-i and there strung over poles and brushed with a thick gum made of beans, which makes the threads stick together; dried, and then woven on hand looms (three 20-yard pieces from each loom with two workers). The product is now heavy with gum (35 to 55 ounces per piece) and has a dark, poor color. To cleanse and improve the color 10 or 12 pieces are boiled for 3 hours in a large iron caldron together with 2 ounces of pig fat to every 30 ounces of silk. Each piece is then washed twice, usually in a stream, and flattened by rolling between wooden rollers, after which it is semidried and folded 16 times to the piece (weight, 25 to 30 ounces). Weaving is carried on in houses which are built with three-quarters of the walls below the ground level. For this reason the business and the workers, who sleep beside their machines, suffer severely in flood seasons. The looms are of local manufacture and cost about $20 gold. A few German looms have been imported, but can not be used with success because their steel combs break the gum-coated threads. Chinese looms are fitted with bamboo teeth. It is estimated that there are 130,000 workers in the Ch'ang-i district. They earn their food, quarters, and an average wage of 4 cents gold per day. An experienced matcher of colors may receive 7 cents per day. Men under 20 years of age are employed in the filatures because their fingers are in better condition to handle the threads.

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QUELQUES REMARQUES

SUR LES

MÉGALITHES DU JAPON

D'APRÈS LE Pr GOWLAND

PAR

F. Victor DICKINS

Troisième Congrès préhistorique de France
Session d'Autun, 1907 (Pages 474 à 480)

LE MANS
IMPRIMERIE MONNOYER
12, PLACE DES JACOBINS, 12

1908

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Quelques remarques sur les mégalithes du Japon, d'après le Pr Gowland.

PAR

F. Victor DICKINS (Seend, Wilts, Angleterre).

M. Gowland, aujourd'hui professeur de métallurgie à South-Kensington, durant son long séjour au Japon, s'est occupé de l'étude des monuments mégalithiques de ce pays. Il a examiné plus de 400 dolmens et tumuli; et il y a recueilli un grand nombre d'objets préhistoriques, dans le sens où cette expression doit être entendue en extrême Orient (1). — C'est de ces dolmens, tumuli et objets, qu'on va projeter quelques photographies (2).

La Préhistoire au Japon, préhistorique dans ce pays lointain, est moderne, relativement à la chronologie occidentale. L'âge de pierre, prolongé jusqu'à nos jours, dans une certaine mesure, chez les Ainu, restes des indigènes aborigènes du Japon, mais actuellement habitant le Yeso, florissait dans les trois grandes îles avant ou vers le commencement de notre ère et dans le nord, nord-est et nord-ouest de l'île principale (Honshu) jusqu'au VIIIe siècle, sinon plus tard. Les restes de cet âge, à caractère plutôt néo- que paléo-lithique, trouvés surtout dans des *Kjökken-möddings*, sont des instruments de pierre, des silex taillés (obsidienne?), des pointes de lances et de flèches, des poteries très grossières; mais les fouilles n'ont mis au jour aucun objet en *fer* ou en *bronze*.

Voici une planche, tirée du célèbre *Nippon Archiv* de *Von Siebold* (publié vers 1830), représentant quelques-uns des ces objets: nouvelle preuve, par parenthèse, que les silex, les *néolithiques* au moins, étaient connus, avant les grandes découvertes de Boucher de Perthes!

(1) William Gowland.— *The dolmens of Japon and their builders.—Trans. and Proceedings of the Japan Society London*, Londres, 1897-1898, IV, p. 128-183, avec planches hors texte.

(2) Cette communication a été illustrée de magnifiques projections lumineuses, à la séance du soir, spécialement réservée à cet effet. — Les explications orales ont été données par M. Marcel Baudouin, spécialiste français en matière de mégalithes.

Les premiers immigrants de race japonaise, venant de la Nordestasie (par la Corée et Tsushima ?), avaient déjà dépassé la phase pastorale; ils apportèrent à leur nouveau pays une civilisation agricole assez avancée, mais encore préhistorique dans le sens ci-dessus indiqué. Ils connaissaient le *bronze* et le *fer*; mais ils enterraient leurs morts sous de simples buttes ou tumuli sans dolmens, ou bien sous des *misasagi* (auguste amoncellement), c'est-à-dire tumuli avec dolmens (chambres de construction mégalithique) dont quelques-uns contiennent des sarcophages en *bois* ou en *pierre* (le plus souvent taillés d'un seul bloc).

M. Gowland pense que les premiers dolmens remontent au IIe ou IIIe siècle avant notre ère. L'avènement du bouddhisme a introduit la crémation. Dans le *Nihongi* ou *Chronique du Japon*, la première crémation est mentionnée sous l'année 694, comme celle de l'impératrice Jitô! Dès lors, la construction des *misasagi* est devenue de plus en plus rare; et, avant la fin du VIIIe siècle, elle aura complètement cessé. Les allusions à ces *misasagi* sont nombreuses dans les poèmes de la Manyôshul (anthologie ancienne). Les corvées rendues nécessaires par ces immenses constructions, excitaient la haine populaire; et de temps en temps le gouvernement cherchait à les limiter par des réglements somptuaires. C'est ainsi que nous lisons qu'en 646 fut défendue la construction des *misasagi* pour Princes du sang, dépassant un travail de 500 hommes durant 5 jours.

En fait de construction, les dolmens du Japon sont en tous points similaires, sinon identiques, avec les dolmens de l'Occident. Il est remarquable que du Japon jusqu'à *l'ouest* de la mer Caspienne, on n'a pas encore (à ce que je sache ?) trouvé des *dolmens* proprement dits, c'est-à-dire des chambres mégalithiques, couvertes d'un tumulus (actuel ou disparu). Toutefois, il est certain que ce mode d'enterrement a été *introduit* au Japon par les premiers *immigrants* japonais. Les Ainu n'ont jamais construit un *misasagi*. Dans les dolmens, on ne rencontre aucune trace de l'âge de pierre. Dans les buttes (tumuli sans dolmens), on trouve des instruments et des armes en *bronze*, des colliers, etc. (graines, perles, cristaux, etc.), des poteries très grossières; mais aucun objet de *fer*. Les instruments, armures, et armes en *fer*, ne se trouvent que dans les chambres mégalithiques (dolmens). Les principales différences entre les dolmens japonais et ceux de l'Occident sont l'absence, dans ceux-là, des instruments de pierre (même d'outils pour tailler les pierres de construction).

La présence (dans quelques-uns) de sarcophages de *bois* ou *pierre*; de *Tsouchi niñgyô*, figures d'hommes et d'animaux [cheval], en terre cuite; d'instruments et d'armes en *bronze* et en *fer*, épées, lances, flèches, armures, fournitures de cheval, etc., très rarement de morceaux d'étoffes : tout cela dénote une période plus avancée dans l'âge du bronze que ne révèlent les dolmens de l'Occident.

Il est à remarquer néanmoins qu'aucune inscription en caractères *chinois* ou autres, ni aucune sculpture n'ont été trouvées dans les dolmens japonais — preuve d'une haute antiquité, car il est certain que, déjà vers le commencement de notre ère, quelque connaissance des lettres chinoises existait au-delà de la mer de Chine.

Au bas de quelques tumuli on trouve un *cercle* serré de tuyaux en terre cuite (*haniwa* cylindriques enfoncés dans le sol). Diamètre, 1 pied ; longueur, 1.5 pieds. Ces *haniwa* ressemblent à des *tuyaux de drainage*. Trois bosses circulaires en divisent l'extérieur en trois concavités très peu profondes. Les *haniwa* se trouvent aussi autour du fossé, comme autour du tumulus, et se comptent par milliers. Leur signification est complètement inconnue ; mais quelques savants prétendent qu'ils représentent les *tsouchi-niñgyó* du Japon.

M. Gowland a classé les vrais dolmens en quatre catégories; à savoir :

I. *Allées couvertes sans chambre*, ou galeries simples, de construction rude; relativement rares.

II. *Allées couvertes* avec une *chambre latérale-terminale*. Ces dolmens sont relativement nombreux, ainsi que ceux de la catégorie suivante.

III. *Allées couvertes* avec *chambre terminale*. Ces dolmens sont assez nombreux.

IV. *Allées couvertes avec deux chambres terminales.*

Des dolmens de ces quatre catégories se rencontrent sur le même horizon, dans une certaine mesure ; mais en général leur développement est dans l'ordre ci-dessus indiqué.

Les endroits où l'on trouve le plus de mégalithes sont précisément ceux où les traditions japonaises placent les premières immigrations, les origines de l'état japonais, la préhistoire des premiers siècles de l'ère chrétienne : l'histoire écrite, plus ou moins authentique, commençant avec le Ve ou VIe siècle.

Liste et Légende des Diapositives projetées.

1° Extérieur d'un *tumulus et dolmen* (classe III), à Asakura (province de Iyo). — Dans les environs, on en trouve 30 de cette espèce. — Tumulus très bas.

2° Intérieur de *chambre couverte de 3 grands* blocs [12 pieds×69×78].

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3° *Dolmen à Hattorigawa* (Kawachi). Chambre un peu plus grande que le n° 2.

4° Intérieur d'un dolmen (Kawachi).
5° id. d'un autre dolmen. »
6° id. » », avec *Sarcophage* ou Ciste.

7° Coupe verticale et plan horizontal d'un dolmen ou *misasagi*, à Abemura (Yamato); longueur 35 pieds.

8° Autre coupe et plan, dolmen à Kuroda (Buzen) à deux chambres; longueur totale intérieure, 69 pieds. Sarcophage dans la chambre terminale. La tradition regarde ce dolmen comme le *misasagi* de la princesse Hayahime (Brillante Princesse): règne du Mikado Keiko (71 — 130 A. D.).

9° Extérieur d'un dolmen, situé dans la province de Yamato.

10° Intérieur d'un dolmen à Koshi, Yamato. — Noter le dressage et l'ajustement admirables des pierres. Le *misasagi* a 160 pieds de diamètre, 36 pieds de hauteur; sommet double.

11° Objets en fer, armes, épées, pointes de flèches; ornements, *Kudatamas* (graines cylindriques), *Magatama* (graines différentes), jaspe, agate, calcédoine, etc., anneaux en métal (argent, etc.), trouvés dans un dolmen à Shiba (Kawachi).

12. Mors de cheval en fer, incrusté de cuivre doré, provenant d'un dolmen à Rokuya (Tamba).

13. Mors de cheval; fournitures en fer de Rokuja.

14. Epées, ornements d'épée, richement décorés d'un travail en cuivre doré.

15, 16, 17, 18. Divers objets en métal: provenance d'un dolmen situé dans la province de Higo. — A noter: 16 souliers en cuivre rouge doré.

19, 25. Poteries diverses des dolmens. Quelques-unes rappellent des formes myceniennes et gnosséennes. Les vases ressemblent aux grandes jarres à gros ventre du rituel shinto, mentionnées si souvent dans les *norito* (anciennes liturgies).

26. Grand tumulus à double sommet, situé à Mise, dans la province Yamato (où l'état japonais a pris origine). C'est le plus grand qu'ait rencontré M. Gowland. Le *misasagi* a une longueur de 1000 pieds, largeur de 600 pieds, hauteur de 90 pieds (on peut y comparer Silbury Hill, ellipse d'à peu près la même longueur: diamètre de 552 pieds, hauteur 170 pieds). La chambre contient deux sarcophages (cistes) en pierre. La tradition regarde ce *misasagi* comme le tombeau du Mikado Mommu (ob. 686 A. D.) et l'impératrice Jito (ob. 782 A. D); mais M. Gowland est d'avis que le tumulus date d'une période antérieure à l'ère chrétienne.

27. Le Misasagi du Mikado Chinai (ob. a. D. 200)
28. — — Niñtoku — 399
29. — — Ingyô — 453

30, 31, 32. Figures humaines (tsouchi niñgyô) en terre cuite provenant des dolmens de la province de Masaohi.

33. Figure d'un cheval en terre cuite, même provenance. — On lit dans le Nihongi que l'ancêtre de la corporation des « ouvriers en argile » Nomino Sukune (le noble dit Nomi) a suggéré à l'Empereur Suinin (au

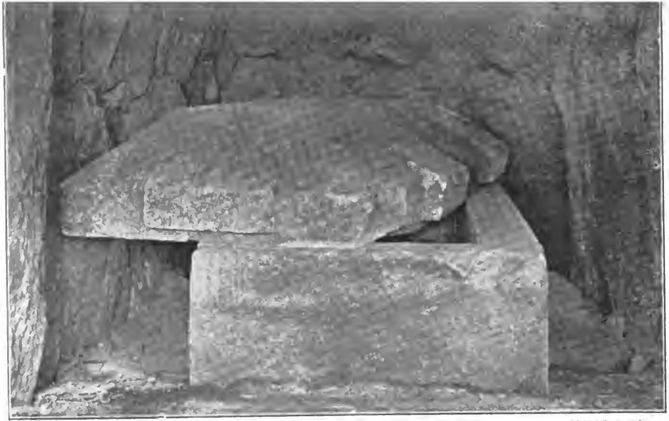
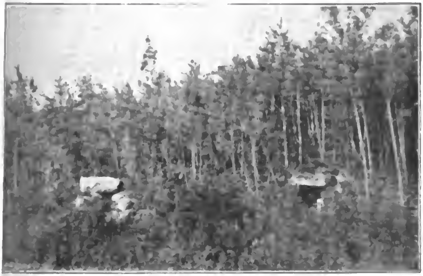


Fig. 1. — Dolmen de Domyoji-Yama (Kavachi), avec sarcophage en pierre.

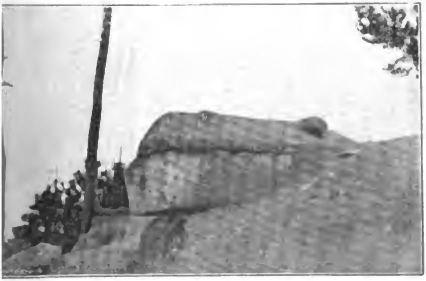
(Cliché Gowland).

Victor DICKINS. MÉGALITHES DU JAPON.



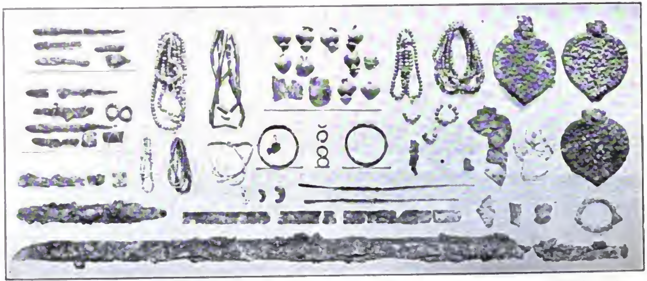
[Cliché Gowland].

Fig. 3. — Vue extérieure des deux Dolmens d'Hattorigawa (Kavachi).



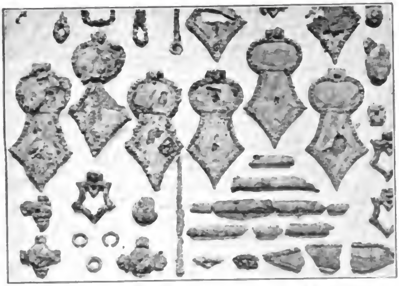
[Cliché Gowland].

Fig. 4. — Tumulus, avec Sarcophage, faisant issue hors du sommet, à Domyoji (Kavachi).



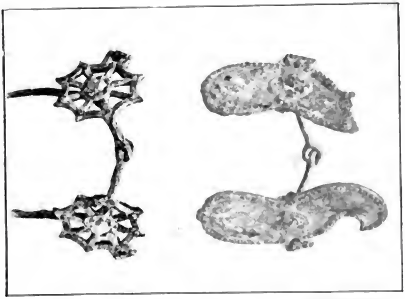
[Cliché GOWLAND].

Fig. 5. — Objets trouvés dans le Dolmen de Shiba (Kavachi).



[Cliché GOWLAND].

Fig. 6. — Ornements de harnais de chevaux, trouvés dans le Dolmen de Rokuya.



[Cliché GOWLAND].

Fig. 7. — Mors de chevaux, trouvés dans le Dolmen de Rokuya.

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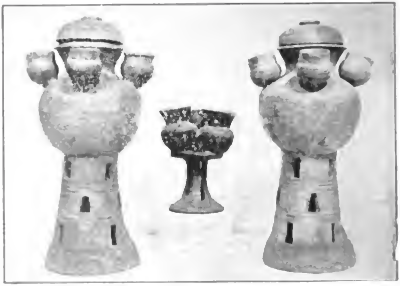
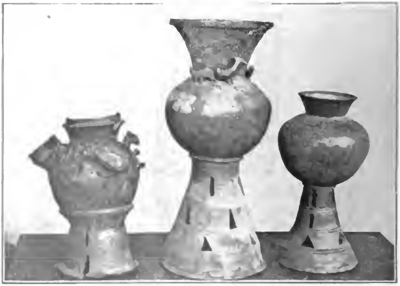


[Cliché Gowland].

Fig. 8. — Vases avec ornements du Dolmen de Rokuya.



[Cliché Gowland].

Fig. 9. — Vases funéraires avec ornements de Bizen, Kotsuke, Yamato (Japon).

commencement de notre ère) le remplacement des hommes, femmes, enfants et chevaux enterrés vifs avec les Mikado (pour leur usage dans l'*ama*, c'est-à-dire le ciel) par ces *haniwa-tsuchi niñgyô* ou tatemono, c'est-à-dire objets debout), figures en terre cuite. — Mais cette coutume paraît avoir existé encore dans le IIIe siècle.

⁂

D. 1. — Objets en silex (obsidienne) ; quelques-uns peut-être sont en bronze. Fin de l'âge de pierre. Fabrique des indigènes primitifs (Ainu). Planche tirée du *Nippon Archiv* (Von Siebold, 1830).

D. 2. — Sarcophage *in situ*.

D. 3. — Transport d'un grand bloc de pierre taillé : Xylographie japonaise. Une poutre traverse le bloc qui est suspendu par de forts câbles ; la poutre elle-même est supportée par une sorte d'échafaudage horizontal dont les membrures restent sur les épaules des porteurs. Le chef, debout sur le bloc, dirige et combine leurs efforts au moyen d'un « bâton signal » de général. La traduction abrégée de la légende est : Transport d'un grand bloc de pierre pour servir de pierre de fondation d'un monastère sur le mont Kôya, par 72 hommes.

D. 4. — Xylographie japonaise représentant la plage de Mitami, d'un certain point de laquelle, au bout d'une ligne droite joignant les points centraux entre les deux rochers du premier plan et les deux récifs du second plan, on voit le lever du soleil au-dessus de l'épaule du mont Fuji, à une date qui est probablement celle d'une fête *shinto*. Cela rappelle et peut servir d'exemple à la théorie de Sir Norman Lockyer, expliquant la signification de *Stonehenge*.

Les dolmens et restes préhistoriques du Japon soulèvent les questions suivantes :

1. L'âge paléolithique est-il vraiment représenté au Japon ?

2. Les premiers immigrants japonais ont-ils apporté du *continent* le mode d'enterrement *sous buttes* (tumuli simples) ?

3. Dans ce dernier cas, l'enterrement dans les *misasagi* (*vrais dolmens*) constitue-t-il un développement *japonais*, ou une *sépulture oubliée sur le continent*, et conservée et développée au Japon ?

M. Marcel Baudouin. — Nous devons vivement remercier notre dévoué collègue, M. F. V. Dickins, d'avoir apporté de Londres les beaux clichés diapositifs qui viennent de vous être projetés ; et nous le prions de transmettre nos félicitations à M. Gowland (1) pour ses belles recherches au Japon.

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(1) M. W. Gowland (de Londres) a bien voulu nous prêter les magnifiques zincs qui illustrent cet article et qui ont paru dans les *Mémoires de la Société Japonaise de Londres* (article cité plus haut). — Le Congrès en remercie très vivement M. le Pr W. Gowland, du *Royal College of Science*, de la *Société des Antiquaires de Londres* et de la *Société Royale*.

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Il est bien certain que les mégalithes japonais diffèrent notablement des nôtres ; ce qui peut s'expliquer de bien des façons, dont les principales sont : ou bien leur époque *tardive* de construction ; ou bien l'utilisation récente des chambres dolméniques, construites autrefois, par l'introduction moderne d'un sarcophage en pierre ou en bois. Pour mon compte, je crois, commme le Pr Gowland, à leur construction *très récente*, en raison du perfectionnement même de leur propre architecture.

Le problème, le plus intéressant à mon sens soulevé par M. Dickins, est celui du *mode d'introduction* au Japon de cette *habitude de constructions funéraires*. Puisqu'il a remarqué que, de la Caspienne à la Corée, on ne trouve pas de dolmens, cette coutume y serait donc venue par un autre chemin que celui de l'est (1). Il n'y aurait rien d'étonnant à cela, car on sait qu'il y a des dolmens dans l'Hindoustan et l'Inde orientale, c'est-à-dire dans le *sud de l'Asie*.

Ce serait donc la *voie* du *sud* qu'il faudrait admettre, jusqu'à présent. Cela ne fait que confirmer, en somme, la théorie qui veut que la *Civilisation mégalithique* ait marché de l'*ouest* à l'*est* (d'Occident en Orient ; et non pas de l'est à l'ouest, comme on l'admet pour le *Bronze*), puisque c'est au Japon que les dolmens sont les plus *modernes* et les plus *perfectionnés* comme construction (la on en trouve en pierre *manifestement taillée*, sans parler des sarcophages intérieurs) (2). Certes, cela ne cadre peut-être pas avec ce qu'on dit de l'immigration japonaise ; mais ce n'est pas une raison pour que ce ne soit pas exact. On peut supposer d'ailleurs, que jadis le Japon ait été réuni au continent du côté de Shangaï (Chine), comme du côté de la Corée ; et que cette « habitude de construction » ait suivi souvent les *côtes, sans pénétrer dans l'intérieur de l'Asie*.

Un ouvrage récent vient peut-être d'éclairer la question sous son véritable jour ; car, par son étude de *La Mythologie shintoïste*, M. Michel Revon (3) a donné une solution très séduisante au problème qui préoccupe les ethnographes : celui des origines de la race japonaise. Faisant abstraction des derniers Aïnos, il est amené à penser que le Japon a été le théâtre de *deux invasions* : l'une venue de Corée, qui a fourni la masse de la population ; l'autre, partie du *Sud* et venue de l'*Archipel malais*, qui a fourni la classe aristocratique. — Ainsi se trouverait expliquée notamment la dualité de types si souvent observée chez les Japonais et peut-être l'introduction des *Dolmens* au Japon.

(1) *Est*, pour la France. — Pour le Japon, il faut, bien entendu, lire *ouest*.

(2) Il ne faut pas oublier qu'il y a des dolmens très analogues dans le Caucase (Martel. *Congrès de Périgueux*, 1905, p. 266).

(3) M. Revon. — *Le Shintoïsme*. Paris, Leroux, 1907, in-8°.

Ce qu'il y a de certain, c'est que jusqu'à présent, en fait de dolmens, le Japon représente le *bout du monde!* C'est là, en effet, qu'ils sont *les plus récents* connus, comme *mobilier*. En effet, ils y datent de l'âge du *fer*; et leurs objets ont une singulière analogie avec ceux de notre civilisation gauloise, ou plus exactement de la période de la *Tène* (mors de chevaux, etc.). Comme *construction*, d'autre part, ils représentent certainement *l'architecture mégalithique* la plus avancée, la plus perfectionnée.

Ces dolmens japonais ne sont donc pas l'écho lointain et affaibli de la grande civilisation de Carnac; mais le développement logique, vers l'est et dans le temps, de cette civilisation spéciale, trop tôt arrêtée dans son essor en France par l'introduction d'habitudes qui résultèrent de l'envahissement de l'Europe par les civilisations de l'âge des métaux et en particulier du bronze d'Orient. Ils montrent que les dolmens ont marché de l'ouest à l'est, si les métaux ont suivi en général le chemin inverse.

Ces réflexions prouvent une fois de plus qu'il a dû y avoir, à l'époque néolithique, un grand *centre de civilisation atlantique*, dont aujourd'hui toutes les traces ont disparu, sauf peut-être du côté de l'Amérique centrale, et un centre analogue dans le Pacifique.

M. A. Guébhard tient à ajouter, au nom de tout le Congrès, et avec prière d'en faire part à M. W. Gowland, ses remerciements à ceux qu'a déjà si bien exprimés, pour M. F. Victor Dickins, au milieu des applaudissements de l'Assemblée, M. le Secrétaire général, que sa compétence toute particulière désignait pour être l'interprète excellent d'une aussi intéressante communication. Nul ne pouvait mieux la mettre en valeur; et c'est à titre de simple indication que M. Guébhard signale l'analogie des monuments dolméniques en pierre taillée, dont il vient d'être montré de si superbes photographies, avec les chambres bilithes du Caucase, dont M. E. A. Martel donna au premier Congrès de remarquables images.

Quelle meilleure démonstration de l'utilité d'un Congrès, même simplement national, que d'y voir ainsi converger la science du monde entier?

Grâce à celle-ci nous apprenons que, si c'est d'Orient qu'est venue à nous la grande lumière, il n'est pas impossible que, vers l'Orient lui-même, quelque chose de nous, jadis, ait émigré. Comme les courants de la mer, ceux de la civilisation doivent avoir leurs retours; et quelles que soient les tempêtes qui les provoquent, ils tendent tous à cette lente unification morale, d'où finira bien par sortir pacifiquement la grande fraternité universelle.

Le Mans. — Imprimerie Monnoyer. — 1908.

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SOME ANCIENT RELICS IN JAPAN.

BY

ROMYN HITCHCOCK.

From the Report of the U. S. National Museum, 1891.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1893.

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SMITHSONIAN INSTITUTION.
UNITED STATES NATIONAL MUSEUM.

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SOME ANCIENT RELICS IN JAPAN.

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Four stone figures in a small inclosure near Hirata Mura, in southern Yamato, are probably the oldest stone images in Japan. I visited the place, in company with Mr. W. Gowland and Mr. K. Nagai, on the afternoon of April 1, 1888. The figures are at the foot of a small circular mound on a slight elevation, near the misasagi of Kimmei Tennō, surrounded by a hedge, with a securely locked gate in front. The small mound itself is said to be the burial place of Kibi hime ō, the mother of Kokioku Tennō and Kotoku Tennō.

While at Nara we presented letters to the governor of Nara ken, and stated our desire to have the gate opened that we might examine and make photographs of the figures. An official letter was accordingly sent to the man in charge, and on our arrival we were met by a police officer, a number of local officials, and most of the villagers, who escorted us to the place. But when we asked to have the gate opened we were told that it could not be done without permission from the Imperial Household Department at Kyoto. This is a characteristic example of Japanese official courtesy such as we more than once experienced. The workman is free to enter the mound inclosure and to care for it, but gentlemen engaged in archæological studies are not permitted to have the gate opened, even when they do not care to tread inside, but only to get a clear field for a photograph. However, with some difficulty we contrived to make several pictures. There being no official regulation about cameras, I ventured to plant mine inside the hedge and work it from without, which was done without remonstrance. The result is shown in Pls. LXIV and LXV, which are different views of the same figures. The resemblance between these rude carvings and the images of Easter Island are quite noticeable.

The story told in a Japanese book, the Koko Nichi Roku, a work on Japanese antiquities, dated the ninth year of Kwansei, was translated by Mr. Nagai as follows: "Long ago, four stone men were dug out of a field near Kimmei Tennō's misasagi. The first one has three faces, the second four, the third three, and the fourth two. Afterwards the natives put them on the misasagi and called them Schichi fuku jin (seven happy gods), which of course means nothing. The significance

by Google

of these figures is unknown, but some persons think that they were made for the pleasure of the workmen, and perhaps this may be so."

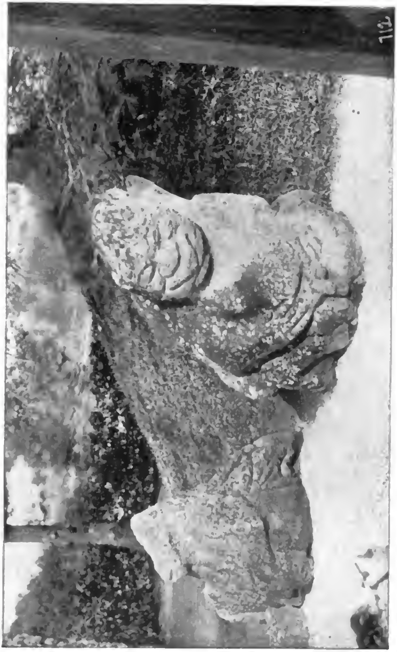
The figures are undoubtedly of great age, and of far more interest than the above account would indicate. They show traces of more than a common workman's skill, and while speculation concerning them is now profitless, they may some day prove of importance. The largest stands about 4 feet in height.

We can approximate to the date of some of the old Japanese monuments with some degree of confidence. For example, in the Province of Kawachi, a short distance from a much frequented pass over the mountain, there are some very old relics of Buddhism. On the top of a projecting spur of the mountain stands a weather-worn stone pagoda (Pl. LXVI), known as the *jiu san to*. Its history is unknown, but it is probably one of the oldest Buddhist monuments of Japan. Near by and facing it is the remains of a cave, the roof and sides of which have almost crumbled away, leaving the back clearly exposed. Some roughly-drawn characters may be traced on the back, one of which evidently represented a face of a Buddha. There are other rocks near, which also bear traces of sculptures, but the forms can not be made out. Somewhat lower down there is a spot where it is evident there once were other stone structures, but it is impossible to infer their character or significance. A short distance from this place, in plain view, on another hillside, there is a second cave, evidently much larger, within which are the ruins of a stone pagoda (Pl. LXVII).

It was during the lifetime of the famous priest Shotoku Taishi, early in the 7th century, that Buddhism became firmly established in Japan, and many of the most celebrated temples were built by him. Among these are Horiu ji, in Yamato, and Tenno-ji, in Ozaka. The tumulus of this Mikado is at the temple Eifuku-ji, near the village called Kasuga, in Kawachi, at the foot of the mountain where these relics are found (see Pl. XLV, in the preceding paper).

Considering the very active part taken by Shotoku Taishi, in establishing the Buddhist religion, and the fact that these ruins are found between his two most famous temples and near his final resting place, it seems probable that they date from his time or earlier, and are therefore more than 1,200 years old.

PLATE LXIV.



STONE FIGURES FROM YAMATO.

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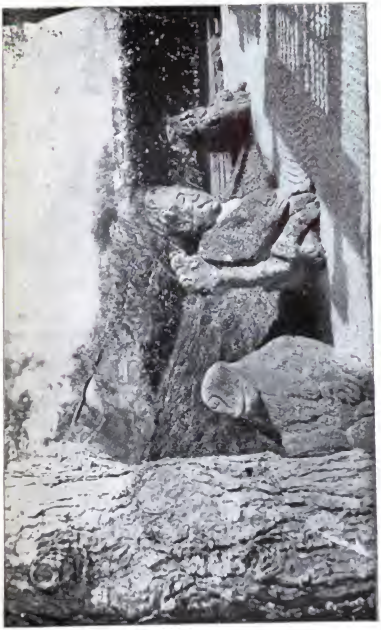
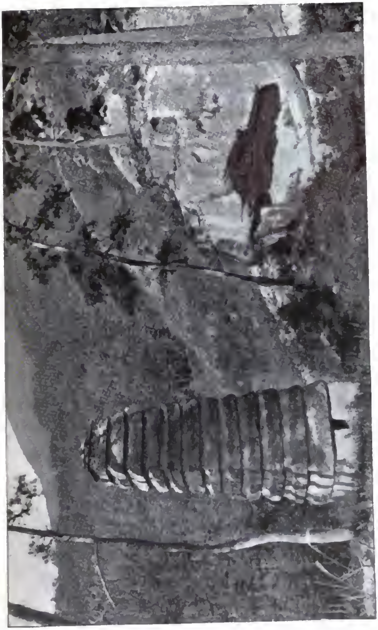
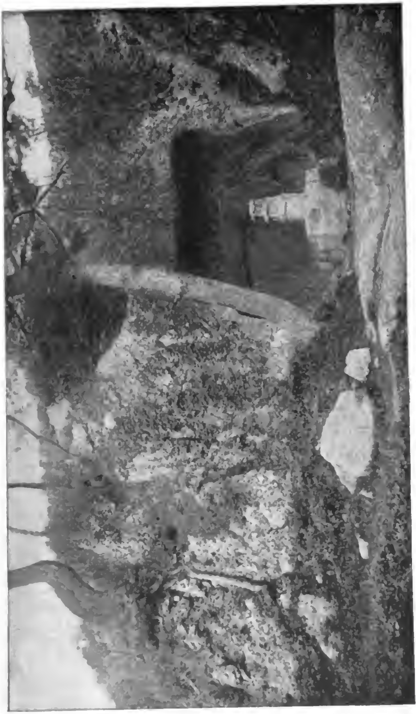


STONE FIGURES FROM YAMATO. (ANOTHER VIEW.)



ANCIENT STONE PAGODA.

PLATE LXVII.



ANCIENT CAVE WITH REMAINS OF A STONE PAGODA.

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~~Jap~~

Jpn

New Series - 5, 1903

A Japanese Fire-walk

(over)

three fine hatchets (with blade and handle both of stone); a finely polished ceremonial celt, ornamented in relief on one side with the face and arms of a human figure, and many other significant specimens.

The part of the collection obtained in Porto Rico, numbering over eight hundred specimens, contains many examples of the typical prehistoric objects from the island, some of which differ in significant ways from those hitherto known. There are several good specimens of the problematical stone rings — now very rare — popularly called "horse-collars," a number of mammiform stone idols of unusual form, varying in size from a marble to a foot in length, and decorated stone masks and stone faces, probably once attached to staves and used in mortuary dances. The peculiar petaloid stone celts vary in form, size, and material, and number several hundred. The Porto Rican collection is particularly rich in fragments of pottery, consisting of simple and decorated handles of bowls, clay images of animals which once formed the relief ornamentation of the same, incised sherds, and ornamented margins of vases, bowls, and platters.

Although the Porto Rican, unlike the Dominican, part of the collection contains no object of a wholly different type from those already known, the value of the component specimens is greatly enhanced by the light thrown on their meaning from information obtained by excavations carried on by Dr Fewkes in different parts of the island. With an insight into aboriginal customs thus obtained, combined with historical research, he will be able to interpret the meaning of well-known objects which has been considered problematical.

In the mountain districts within ten miles of a Porto Rican town called Utuado, Dr Fewkes heard of over twenty artificial structures called by the natives *juegos de bola*, or ball courts. These structures, often known by the more expressive term "Indian corrals," appear to be the only prehistoric aboriginal attempts at buildings which survive. They consist of rectangular, level enclosures, slightly sunken below the surrounding plain, varying in size from a few hundred feet to as many yards. As the name "corral" would imply, they are surrounded by aligned stone slabs, one or more of which are cut into massive idols or decorated with rude pictographs. Excavations were made in one of these structures near Utuado in order to determine their character, and good evidence was found that one, at least, of their uses was the celebration of those mortuary dances, well known to students of early Spanish writings like those of Oviedo, as *areitos*. Just outside these enclosures Dr Fewkes discovered artificial mounds which excavations revealed to be prehistoric Porto Rican cemeteries, a discovery of prime importance, as localities where the aborigines deposited their dead had never before been definitely determined. In one of these mortuary mounds he found many skeletons surrounded by mortuary offerings, and brought back to Washington two comparatively good skulls which are believed to be the only prehistoric Porto Rican crania in our museums. Similar osteological material, including several skulls, was likewise found in caves, but these latter places of burial appear to be more modern than the mounds near the dance enclosures.

The floor of a typical cave, the walls of which bore "Carib" pictographs, was also explored for the purpose of obtaining information regarding prehistoric cave occupancy in Porto Rico. While it was developed that the individual cave examined, although prehistoric and occupied for a long time, was resorted to by people of the same culture as those who used the mortuary dance places, this occupancy was of no great antiquity. The culture of the earliest and the latest occupants of this cave was found to be practically identical. Trenches ten feet deep dug across the entrance to the cave, where the débris caused by human presence was most extensive, showed no material difference in the character of the pottery and stone objects found near the original floor of the cave and those on the surface of the débris. Considerable attention was given to the study of Porto Rican pictography, which is abundant in caves and on boulders along the larger rivers.

Dr Fewkes' studies will be treated in special papers, and the general results, including an account of the more striking objects collected, will shortly be published in a preliminary account of the explorations.

A Japanese Fire-walk.— The wife of a prominent American naval officer recently sojourning in Japan, writes to her family the following description of a Japanese fire-walk which was witnessed by her at Tokio in September last. Her interesting narrative of this most interesting rite reminds one of a similar ceremony witnessed by Mr S. P. Langley on the Island of Tahiti, in the summer of 1901, an account of which appears in the *Smithsonian Report* for the year named.

"When we left the T———'s we went to a temple in the Kanda quarter of the city, where there was to be a fire-walking—a Shinto ceremony which is not very ancient, nor originally Japanese, but brought here from India by Shinto priests. We were given seats on a porch or verandah of the temple that looked into a small court. In the midst of the court was a bed of charcoal some six yards long, about two yards wide, and some two feet deep or thick. On top of the coal were a quantity of straw bags in which coal is carried here; the straw was as long and wide and much deeper than the charcoal. We waited some time while prayers and chantings went on in the temple and processions of priests in gorgeous robes passed through the corridor behind where we were sitting. Then some attendants went into the court, which was crowded with spectators, roped off at a safe distance from the pile of coal, and swept all around the pyre until the earth looked as clean as a floor — not a Japanese floor, for nothing is so clean as that.

"The attendants were in white cotton garments (with bare arms, legs, chests, and heads), and, baldric-wise, a yellow twisted cotton scarf, looking almost like a rope. They brought a number of bundles of papers, which we were told were prayers, and threw them upon the pyre, then lighted the straw which immediately flamed and roared and crackled and sparked until we were uncomfortably warm where we sat. By this time it was past six o'clock and nearly dark; the court was lighted by large paper lanterns, the great fire, and a full moon which shown into it.

"Presently the straw burned down and the whole mass of coal was thoroughly ignited; then the attendants came with long bamboos and beat the fire until no sparks flew, and fanned it with great white fans on long bamboos. Then they swept clean all the ground where ashes or bits of coal had fallen, and fanned the fire till it glowed all through the pile. Then a number of priests came without their splendid robes, dressed in loose trousers to the knee, and a short tunic, leaving arms and chests also bare. The whole costume was of white cotton. They walked around the fire, striking sparks with flint-and-steel, and carrying trays full of salt. Afterward mats were spread at each end of the fire and the salt was poured out on them; then followed more prayers and more fanning of the fire. An English woman sitting near me said, 'Ah, of course they will never go into that; one could not expect it! Ah, no; they're timid; of course they're timid; naturally they are; any one would be. You will see that they will not.—Gracious!' (with a loud scream) 'he's going in; he's gone!' And he certainly had.

"Bare footed, having rubbed his feet a second in the salt, one priest walked calmly down the middle of the fire; another followed, and another, and another, I do not know how many. One, G——— said, 'strolled' through the eighteen feet of red-hot coals with no apparent discomfort, though we were holding up fans to keep the heat from our faces and eyes. We watched them for some time, and then a number of the people, who were looking on, followed the priests,—one a woman with a baby on her back; several little boys went leaping across, while two modest, refined looking little girls walked calmly through.

"The Shintoists claim that, having been perfectly purified by their prayers and ceremonies, no evil has any power over them. Fire they regard as the very spirit of evil; so twice a year, I believe, they go through this fire-walking as a kind of 'outward and visible sign of inward spiritual grace.' It was very wonderful and interesting, and having seen the whole thing from the beginning, we all came away entirely bewildered."

Monosyllabic Languages. — The so-called "monosyllabic" and tonal languages of eastern Asia, of which Chinese is the most important representative, have been considered by many authorities to exemplify "degeneration" in speech, being the attritional or worn-down forms of a much more highly organized linguistic system. The more reasonable view that this family of languages constitutes rather one of the great primal groups of human speech has been reënforced of recent years. In a paper on the Lolos and other more or less primitive and semicivilized tribes of western China, read at the 1902 meeting of the British Association, A. Henry, from a comparison of the language of the Lolos, Miaotze, etc., and Chinese, expresses the opinion that the languages in question "form a distinct primal group and are not the result of linguistic degradation." These languages are extremely important from an evolutional point of view. A. F. C.

Ostiaks. — According to K. F. Karjalainen (*Anz. d. Finn.-Ugr. Forsch.*, 77, 1902) the Ostiaks of Tobolsk, Surgut, Beresov, and Narym numbered in 1890 some 18,000 souls. Far from disappearing, this primitive people has increased about six percent during the last fifty years. There are distinguished seven dialects of Ostiak — Irtysh, Kondinsk, Berezov, Obdorsk, Surgut, Vach, and Upper Ob, the last being spoken by the fewest people, some 1500; the Obdorsk by the most, some 3500.

Native Languages of Victoria. — All the languages of the native tribes of eastern Victoria, although differing widely in vocabulary, are the same in grammatical structure as the Thurrawal tongue described by me in an article to the Royal Society of New South Wales in 1901.[1] The nouns, pronouns, verbs, adverbs, prepositions, etc., can be inflected for number and person, as illustrated in the article cited. There are a singular, a dual, and a plural number, with a double form of the first person of the latter two — one including, and the other excluding, the party spoken to.

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[1] "The Thurrawal, Gundungurra and Dharruk Languages," *Journ. Roy. Soc. N. S. Wales*, vol. XXXV, pp. 127–160.

Harvard Journal of Asiatic Studies
May, 1939

JAPANESE ARCHEOLOGICAL WORK ON THE ASIATIC CONTINENT IN 1937 AND 1938[1]

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HARVARD UNIVERSITY

The past two years of Japanese archeological work on the Asiatic continent have witnessed no startling new discoveries by the Japanese comparable to the first Lo-lang finds, the painted basket, or the golden crowns of Silla, which so moved the archeological world a few years ago. However, the Japanese have continued diverse and geographically wide-spread excavations throughout Korea and Manchuria, which have been carefully planned to cover the most necessary fields, and which have yielded valuable, if not spectacular, results.

The war in the Far East has not greatly altered the work of the Japanese archeologists. It is true that at least one expedition to Korea was postponed during the early months of the war, and it is probable that archeological work in Manchuria was somewhat disrupted in 1937, but, except for the loss of several young archeologists who have been mobilized, the war seems to have caused no serious impairment of Japanese archeological work. On the other hand, it is influencing strongly the general interests of the Japanese archeologists and is causing a reorientation in their activities on the continent. The result is an increasing emphasis on excavations in China.

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[1] This article, which is the outcome of a short paper read on April 11, 1939 before the American Oriental Society at Baltimore, is necessarily somewhat fragmentary in content, for not all the most recent Japanese archeological material was available while I was writing it. It is based largely on the 1938 number of *Kōkogaku nempō* 考古學年報, which covers the year 1937 in Japanese archeology, on the 1936 number of *Koseki chōsa hōkoku* 古蹟調查報告 of the *Chōsen koseki kenkyū kai* 朝鮮古蹟研究會, published in June 1937 and containing reports and pictures of excavations made in the early part of that year, on private reports on the subject sent me by ARIMITSU Kyōichi 有光教一 of the Government General Museum in Keijō, by TSUNODA Fumie 角田文衞, an Assistant in the Department of Archeology at the Kyōto Imperial University, and by NAGASAWA Masao, Librarian of the *Kokusai Bunka Shinkōkai*, on recent numbers of *Kōkogaku zasshi* 考古學雜誌 (abbreviated as *KZ*), *Kōkogaku ronsō* 考古學論叢, *Mita hyōron* 三田評論, and other periodicals, and on several of the books mentioned in this article. *Kôkogaku ronsō*, which is probably still unknown to many in the Occident, is a new archeological journal, which made its appearance a little over two years ago. It is published rather irregularly by the *Kōkogaku kenkyū kai* 考古學研究會 of Kyōto. On the whole, *Kōkogaku ronsō* contains longer articles than those of *KZ*, and it carries more on archeological work in other parts of the world.

Important archeological work has been carried on in many parts of Korea during the past two years. In Keishū, the ancient capital of Silla, in southeastern Korea, repair work last spring on the stone stupas of Sengunri 千軍里 led to the discovery of the whole plan of the ancient monastery. The measuring and photographing of the stone Buddhas of Nanzan 南山 has been continued. Among the recent publications on the archeological remains of this region one should mention the monographs of Saitō Tadashi 齋藤忠 of the Keishū Museum and of Arimitsu on the graves of Silla,[2] and a loose leaf collection of 76 excellent plates with the English title, *Bukkoku-ji Temple and Sekkutus-an Cave in Keishu, Korea*, which was published in March 1938 by the Government General as the first of its new series of *Albums of Korean Treasures and Historic Remains* (*Chōsen hōmotsu koseki zuroku* 朝鮮寶物古蹟圖錄).

In Fuyo 扶餘, the ancient capital of Paekche, in southwestern Korea, which hitherto has yielded few important remains, a very interesting discovery was made in March 1937.[3] This was a set of eight decorated tiles, which unquestionably date from the Paekche period and, therefore, antedate the year 663. They are stylistically like the Koguryŏ wall paintings and are closely related to the art of the Six Dynasties period in China. Another important discovery, published in the summer of 1937,[4] was the plan of an Ancient Paekche monastery at Gunshuri 軍守里, which was of the same style as that of the Shitennōji 四天王寺, one of Japan's first great monasteries. More recent excavations of Paekche tombs at Fuyo by Umehara Sueji 梅原末治 of the Kyōto Imperial University have brought to light excellently made jade and filigree ornaments.

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[2] In March 1937 Arimitsu published a small volume with 54 illustrations entitled *Keishū Chūkyōri sekishitsu kofun chōsa hōkoku* 慶州忠敎里石室古墳調査報告, the report of the 1932 excavations of tombs with stone cists at Chūkyōri. In the same month Saitō put out a similar report on the results of the 1934 excavations of two tombs in Keishū, entitled *Keishū Kōnanri daihyakukugo fun Kōgari daijūshigo fun chōsa hōkoku* 慶州皇南里第百九號墳皇吾里第十四墳調査報告, and in *KZ* for May 1937 (pp. 304-320) he has an article entitled "Shiragi no kyōkeifun" 新羅の瓢形墳 on the double grave mounds of Silla, which he believes developed from the custom of burying a man and his wife under the same mound.

[3] Cf. Arimitsu, Chōsen Fuyo shinshutsu no moyō kawara 朝魚扶餘新出の文様塼 *KZ* (1937) 717-732 and *Koseki chōsa hōkoku* (see note 1), pp. 65-73 and plates 69-81.

In the Heijō area in northwestern Korea the walls of the Han commandery of Lo-lang have been studied recently, and the remains of a well and of some structures have been discovered. A tomb of the Han commandery of Tai-fang 帯方 was found in Kōkaidō between Heijō and Keijō in May 1938 and was examined by Saitō. Many more Koguryŏ tombs in the vicinity of Heijō have been excavated during the past two years, and last autumn Koizumi Akio 小泉顯夫 of the Heijō Museum studied the remains of the Koguryŏ capital at Heijō and discovered the foundations of an important octagonal building.

In other parts of Korea there have been no outstanding discoveries, but among the more important studies on these regions should be mentioned Yagi Jōsaburō's 八木奘三郎 *Chōsen Kankyōhokudō sekki kō* 朝鮮咸鏡北道石器考, a book on the stone implements of the northernmost province of Korea, an article by Arimitsu on the prehistoric remains of east central Korea,[5] and an article by Suenaga Masao 末永雅雄 on the development of the ring-pommeled sword as it passed from China through Korea to Japan.[6]

At Chi-an 輯安, on the Manchurian side of the middle course of the Yalu River, the site of the Koguryŏ capital of the third and fourth centuries has again been the scene of intensive archeological activity during the past four years.[7] Expeditions in 1935

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[4] Cf. *Koseki chōsa hōkoku*, pp. 45-55 and plates 48-62.

[5] Chōsen Kōgendō no senshi jidai ibutsu 朝鮮江原道の先史時代遺物, *KZ* (1938) 709-729.

[6] Kantō daitō 鐶頭大刀. *Kōkogaku ronsō* 8. 107-138.

[7] The Chi-an site was first studied scientifically by Torii Ryūzō 鳥居龍藏 in 1905

and 1936, participated in by **Hamada** Kōsaku 濱田耕作,[8] **Umeh**
and **Mizuno** Seiichi 水野清一 of Kyōto, **Ikeuchi** Hiroshi 池
and **Oba** Tsunekichi 小場恒吉 of Tōkyō, **Fujita** Ryōsaku
亮策 of Keijō, and **Mikami** Tsuguo 三上次男 of the Manchur
government, studied several newly discovered tombs with
paintings and made a general survey of the previously kn
archeological sites of the region, including the remains of the w
of the Koguryŏ capital. The results of these expeditions are
pearing in two well illustrated volumes under the title *T'ung-*
通溝. The first volume is by **Ikeuchi** and was published late
year. The second volume is by **Umehara** and over two months
was said to be in press.[9] Two interesting articles by **Nakamu**
Kiyoe 中村清兄, which are in part results of the excavation
1935 and 1936, appeared in recent numbers of *Kōkogaku ron*
They are on the subject matter of the wall paintings of
Koguryŏ tombs and on the stars portrayed in them.[10]

The excavation and study of more tombs with wall painti
were continued at Chi-an in the summer of 1937 by **Kuroda** G
黒田源次. Last April **Fujita** spent about three weeks there stu

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and was early brought to the attention of western scholars by **Chavannes** in
monuments de l'ancien royaume coréen de Kao-keou-li, *TP*^{2} 9.236-263 and in
famous *Mission archéologique dans la Chine septentrionale*. Chi-an was neglecte
scholars for about two decades before the resumption of work in 1935.

[8] **Hamada**'s death on July 25, 1938 was a severe blow to Far Eastern archeol
His obituary notice by Prof. **Elisséeff** in *HJAS* 3.407-429 contains a bibliogr
in English of his books and articles, which runs to 249 items. In a supplement of
pages devoted to **Hamada** in *Kōkogaku ronsō* 8, there is a similar bibliograph
almost 300 works (pp. 14-30).

[9] I have not as yet seen even the first volume of this work, but I have seen **Ikeuc**
earlier summary of it, which appeared in article form as Manshūkoku Antōshō Shūa
ni okeru Kōkuri no iseki 滿州國安東省輯安縣に於ける高句麗の遺蹟,
(1938) 135-175. **Ikeuchi** also has a recent article on the history of the discovery
study of the stele of King Kwanggaet'o 廣開土 (392-412), one of the most
portant remains of the Chi-an region (Kōkuido ō hi hakken no yurai to hiseki no
廣開土王碑發見の由來と碑石の現狀, *SZ* [1938] 1-29). In the January n
ber of this year's *Shirin* **Umehara** has an article on the forms of the Koguryŏ to
which is largely based on the recent work at Chi-an (Kōkuri no bosei ni tsuite
麗の墓制に就いて, pp. 120-137).

[10] Kōkuri jidai no kofun ni tsuite 高句麗時代の古墳について, 4.374-401
Futatabi Kōkuri jidai no kofun ni tsuite 再び高句麗時代の古墳につい
7.61-84.

ing the disposition of the tombs, and during the summer, from June to August, Oba continued work on the wall paintings of the tombs, but he reported that he was somewhat hampered by the activity of bandits in the neighborhood.

At Yen-chi-hsien 延吉縣 in Manchuria near the northernmost tip of Korea the remains of two walled towns of the Po-hai 渤海 period and some tombs of the Koguryŏ period were studied by Fujita in the spring of 1937. In a second expedition last July he excavated some fifty stone age graves there. In them were found such objects as bone ornaments adorned with carvings of human faces, bone needles, and polished stone implements.

Few important discoveries have been made recently in the central portion of Manchuria, but in April 1937 a tomb with wall paintings, discovered the previous year at Shih-chü-tzŭ-t'un 石岨子屯 near Liao-yang 遼陽, was investigated, and in the February number of *Kōkogaku zasshi* for this year Sonoda Ikki 園田一龜 reported on his examination of the tomb in Chin-lin Province of the first emperor of the Juchên (Chin) dynasty.[11] Several recent articles by Shimada Sadahiko 島田貞彥, Komai Kazuchika 駒井和愛, Mori Osamu 森修, and Umehara discuss some of the recently discovered Manchurian finds,[12] and a collection of essays by Mizuno, Komai, and Mikami on archeological work in north Manchuria, entitled *Hokuman fūdo zakki* 北滿風土雜記, appeared only a few months ago.[13]

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[11] Kin Kangankiin no fumbo ni tsuite 金完顔希尹の墳墓に就て, *KZ* (1939) 73-86.

[12] Shimada, Manshūkoku Kinshūshō shutsudo no kempeikei dōki 滿洲國錦州省出土の劍柄形銅器, *KZ* (1937) 335-339, Manshūkoku shutsudo no iwayuru keikan tsubo ni tsuite 滿洲國出土の所謂鷄冠壺に就いて, *Kōkogaku* 考古學 (1937) 38-43, Manshūkoku shinshutsu no kogindōmen oyobi ni san no seidō ibutsu ni tsuite 滿洲國新出の古銀銅面及二三の青銅遺物について, *KZ* (1938) 109-118, Manshūkoku Kitsurinshō Sekihirei hakken Kindai ibutsu ni tsuite 滿洲國吉林省石碑嶺發見金代遺物について, *KZ* (1938) 236-242; Komai, Manshū shutsudo no tajū dōkyō ni tsuite 滿洲出土の多紐銅鏡について, *KZ* (1938) 84-92; Mori, manshū hakken no Kandai seidôki ibutsu 南滿洲發見の漢代青銅器遺物 *Kōkogaku* (1937) 328-348; Umehara, Kempeikei dōki no shinrei 劍柄形銅器の新例 *KZ* (1937) 749-753.

[13] One might also mention Torii's *Ryō no bunka o tadoru* 遼の文化を探る, which was published in January 1937. It is largely a travelogue account of his exploration of Liao Dynasty remains in Manchuria in 1933 and 1935.

In Jehol Province and in contiguous portions of Inner Mongolia, the Japanese have been carrying on some very important excavations. Foremost among these was the thorough excavation of a neolithic and early bronze age site near Ch'ih-fêng 赤峯. The culture of this region showed a meeting of the red painted pottery culture, which came to Jehol from the west, and the combed ceramics culture of the north. The skeletal remains indicated that the prehistoric people of this area, who were called barbarians by the Chinese, were really racially closer to the Chinese than to the later Mongolian peoples. The actual excavating took place at Ch'ih-fêng under the leadership of HAMADA in 1935, but the excellently illustrated full report of the work did not appear until last September. It forms the sixth volume of Series A of *Archaeologia Orientalis*, published by the Far-Eastern Archaeological Society (Tōa kōko gakkai 東亞考古學會). It has a short English summary and the English title of *Hung-shan-hou, Ch'ih-fêng, Prehistoric Sites at Hung-shan-hou, Ch'ih-fêng in the Province of Jehol, Manchukuo.*

Several other smaller excavations of similar sites have been made in the past few years in Jehol. In the May 1937 number of *Kōkogaku zasshi*, AKABORI Eizō 赤堀英三 of Tōkyō Imperial University and MIKAMI published an article on their findings at Ta-miao 大廟, an important neolithic site west of Ch'ih-fêng, which they excavated in 1935 as a side expedition from the main Ch'ih-fêng expedition.[14] In July 1937 another party excavated other neolithic sites in the neighborhood of Ch'ih-fêng,[15] and KODAMA Shigeo 兒玉重雄 and MARUOKA Yoshio 丸岡良郎 have been active in the Ch'êng-tê 承德 area in southern Jehol.[16]

In Inner Mongolia the site of the Mongol capital, Shang-tu 上都, at Dolonor a little west of the Manchukuo border, was studied in the summer of 1937 by an expedition under the leadership of HARADA Yoshito 原田淑人 of Tōkyō Imperial University, and the results were published in part by ISHIDA Mikinosuke 石田幹之助 in *Kōkogaku zasshi* for last year.[17] In 1938 an expedition from Keijō Imperial University explored the walled town of Yü-hsien 蔚縣 in the southern tip of Chahar, which is thought to date back to the Warring States period, and there are plans to send a full archeological expedition there in the near future.[18]

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[14] Daibyō 大廟, *KZ* (1937) 281-303.

[15] Cf. SHIMAMURA Kōzaburō 島村孝三郎 and KOBAYASHI Tomoo 小林知生, Sekihō Shidōseishi (kita) no iseki 赤峯四道井子(北)の遺蹟, *KZ* (1938) 258-265.

[16] Cf. their *Nekkashō Shōtoku kinkō shutsudo ibutsu hōkoku* 熱河省承德近郊出土遺物報告, 1937, and a further report in *KZ* (1938) 277-280.

Several large and important works on Chinese and Central Asian archeology have been published by Japanese during the past two years. In April 1937 the full report of the three famous ŌTANI expeditions to Central Asia, made between the years 1902 and 1914, was finally published in two huge volumes under the title *Shin Saiiki ki* 新西域記. The delay of over two decades in the publication of this material has greatly lessened its interest. Since what purports to be an index is really only a detailed table of contents, the work is not easily used for reference purposes. Although many of the illustrations are still of great interest, on the whole they are already familiar to those who have visited the Keijō, Ryojun (Port Arthur), and Kyōto Museums.

The *Tonkō ga no kenkyū* 燉煌畫の研究，an important and detailed study of the paintings of Tun-huang, was published by MATSUMOTO Eiichi 松本英一 in March 1937 in two well indexed and amply illustrated volumes.

In September of last year, TOKIWA Daijō 常盤大定 published a new volume on Chinese Buddhist remains, entitled *Shina bukkyō shiseki tōsa ki* 支那佛教踏査記. Although it is a large book with 150 illustrations, it is for the most part a travelogue account of his five pilgrimages to China between the years 1920 and 1929 and contains little not to be found in his monumental *Shina bukkyō shiseki.*

In March 1937 appeared UMEHARA's *Rakuyō Kinson kobo shūei* 洛陽金村古墓聚英，a collection of excellent illustrations of some of the more important objects thought to have come from Chin-

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[17] Gen no Shōto ni tsuite 元の上都に就いて, *KZ* (1938) 73-83, 527-541, 786-805.

[18] One publication on Inner Mongolia worthy of notice is the report of the two expeditions to Mongolia in 1931 and 1935 of the Far-Eastern Archaeological Society. It appeared in 1937 under the title *Mōko kōgen kōdan ki* 蒙古高原横斷記.

ts'un 金村 near Lo-yang, together with an explanatory text. T
work has been rather strongly criticized by KARLGREN in No
on a Kin-ts'un Album, *BMFEA* 10.65-81.

In June 1938 UMEHARA also published *Kodai hoppō-kei bum*
tsu no kenkyū 古代北方系文物の研究, studies on the so-cal
Scythian culture of northern Asia, while in October of the sa
year, twenty-two of his articles on Chinese archeology appeared
book form under the title *Shina kōkogaku ronkō* 支那考古學論
The volume, which has 155 plates and other illustrations as w
as an index arranged according to the Latin alphabet, brings
gether in easily available form many of UMEHARA's most inter
ing short monographs, some of which were virtually lost
Occidental scholars in minor periodicals.

SEKINO Tadashi's 關野貞 *Shina no kenchiku to geijutsu* 支那
建築と藝術, published in September 1938, is a similar collect
of earlier monographs and articles, which deal for the most p
with ancient Chinese architecture.

As the result of a detailed study in 1936 of the stone grott
of the Northern Ch'i period at Hsiang-t'ang-shan 響堂山 near
Hopei-Honan border, MIZUNO and NAGAHIRO Toshio 長廣
published in June 1937 an important study on these grottoes
their Buddhist sculpture under the title *Kyōdōsan sekkutsu*
山石窟.

In December 1937 HARADA published *Kan Rikuchō no fu-*
shoku 漢六朝の服飾, a detailed study of the costumes and perso
adornments of the Han and Six Dynasties periods based on do
mentary and acheological sources. This work forms a compan
volume to his earlier *Shina Tōdai no fukushoku* 支那唐代の服
which covered the T'ang Dynasty.

Other recent works which should be mentioned are OKUDA
Masahiro's 奥平昌洪 *Tōa senshi* 東亞錢志, a two volume hist
of the coins of the Far East, ŌTSUKA Minoru's 大塚稔 *Sh*
komeiki deizō zukan 支那古明器泥像圖鑑, a collection of Chin
funerary clay figures, and the section on ship, carriage, and ho
fittings of the *Shina koki zukō* 支那古器圖攷 of HARADA
KOMAI. There have also been many important short monogra

on various aspects of Chinese archeology in the *Tōhō gakuhō* 東方學報 and other periodicals.[19]

As a direct consequence of the war, several parties of Japanese scholars have recently made trips to China, partially for scientific reasons and partially to encourage the Japanese troops. One of the scientific objectives of some of these expeditions has been to survey the archeological field in China and to make plans for further excavations. The most important of these expeditions was that of Keiō University, which was sent to China last summer.[20] One party under the leadership of Prince ŌYAMA 大山 surveyed a few archeological sites in north China and spent several days in the vicinity of Chang-tê 彰德, or An-yang, in northern Ho collecting archeological remains unearthed when the Chinese defense trenches on the north side of the hill known as Hou-ch 後丘 [20a] and at Kao-lou-chuang 高樓莊, a new archeological only a few hundred yards away. At the latter site pits were fou containing only painted pottery and others with only Han-st pottery.

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[19] *Tōhō gakuhō*, Kyōto, no. 8 (Oct. 1937): KOMATSU Shigeru 小松茂 and YAMANOUCHI Yoshito 山內淑人, Kokyō no kagakuteki kenkyū 古鏡の化學的研究 (A Chemical and Metallographic Study of Ancient Far Eastern Mirrors), pp. 11-31; UMEHARA, Kokyō no kagaku seibun ni kansuru kōkogakuteki kōsatsu 古鏡の化學成分に關する考古學的考察 (Archaeological Notes on the Chemical Analysis of Ancient Far Eastern Mirrors), pp. 32-55; NAGAHIRO, Hokugi karakusa moyō no ni san ni tsuite 北魏唐草文樣の二三について (Notes on some Honeysuckle Ornaments in the Northern Wei Dynasty), pp. 97-117; OGAWA Shigeki 小川茂樹, Shinshutsu Tan Hakutatsu ki kō 新出檀伯達器考 (A Study of the Inscriptions of Bronze Vases Discovered at Hsin-ts'un 辛村, Chün-hsien 濬縣, Honan), pp. 180-225; and MIZUNO, Chōsha shutsudo no mokugū ni tsuite 長沙出土の木偶について (Some Wooden Figures from Ch'ang-sha, Hunan), pp. 226-241; *Tōhō gakuhō*, Tōkyō, no. 8 (Jan. 1938): KOMAI, Dōgyō kō 銅魚考 (On Fish Shaped Ornaments of Bronze of Ancient China), pp. 153-158; and TAKI Ryōichi 瀧遼一, Kane no rekishiteki kōsatsu 鐘の歷史的考察 (An Historical Study of Ancient Chinese Bells), pp. 159-192; *KZ* (1937): SHIRATORI Kurakichi 白鳥庫吉, Shina no geijutsu-jō ni arawaretaru inyō shisō 支那の藝術上に現はれたる陰陽思想 (The Concept of *Yin and Yang* in Chinese Art), pp. 103-110; and KOYAMA Fujio 小山富士夫, Saikin ni okeru Shina koyōshi no hakken 最近に於ける支那古窯址の發見 (The Recent Discovery of Ancient Chinese Kiln Sites), pp. 563-584; *KZ* (1938): ŌGUCHI Masao 大口理夫, Rikuchō sekkutsu jiin ni okeru butsugan no shōchō 六朝石窟寺院に於ける佛龕の消長 (The History of Niches in the Cave Temples of the Six Dynasties Period), pp. 645-657; *Shirin* (1938): MIZUNO, Hokushina sekkutsu kōzō ron 北支那石窟構造論 (The Construction of the [Buddhist] Grottoes of North China), pp. 78-96; *Tōyōshi kenkyū* 東洋史研究 3 (1937-38): UMEHARA, Kandai no shokubutsu moyō ni tsuite 漢代の植物文樣に就いて (Sur quelques ornements des motifs végétaux dans les arts sous les Han [sic] dynasties), pp. 89-102; UMEHARA, Ōmō jidai no shikki meibun 王莽時代の漆器銘文 (Les inscriptions sur laques sous le régne de Wang-mang [sic]), pp. 226-230.

[20] Rather detailed reports from members of the various parties of the Keiō expedition appeared in *Mita hyōron* (1938) June pp. 34-36, July pp. 34-39, August pp. 34-39, October pp. 28-32, and November pp. 36-39.

A second but smaller party under Shibata 柴田 made a ha survey of archeological sites in both central and northern Chi but the most interesting work of the Keiō expedition was d by a party under the leadership of Matsumoto Nobuhiro 信廣.[21] This group, together with the Japanese Shanghai Instit of Natural Sciences (Shanhai shizen kagaku kenkyūjo 上海 科學研究所), surveyed the material remaining at the Instit of History and Philology of the Academia Sinica, at the Ku-ku ku-wu pao-ts'un-so 故宮古物保存所), and at the Institute Ceramics (T'ao-tz'ŭ shih-yen-so 陶瓷試驗所) in Nanking attempted to put them in order.

The party reported that the building of the Academia Sin had been used as a barracks by both Chinese and Japanese tro and was consequently in great disorder. Practically no Sh remains from Anyang had been left there by the Chinese scho when they withdrew from Nanking, but most of the other obj were still in the building. Almost all of the articles formerly st in the Ku-kung ku-wu pao-ts'un-so were missing. The Insti of Ceramics had been damaged by Japanese shells. Some boxes of unstudied Anyang finds and of exhibits from the Pe museums, which before the war had been sent by the Chines Nanking, were found stored at the Institute of Ceramics, but majority of these boxes had been broken into and looted. S of the invaluable objects lost in this manner were already b offered for sale in the Nanking thieves' market, and Matsum

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[20a] I suspect that this is an error for Hou-kang 後岡, which means the same is a well known archeological site in the neighborhood of Anyang.

[21] Matsumoto, who is well known in the west because of his years of stu Paris and his articles in French on Japanese mythology, has written some ver but surprisingly jingoistic and anti-western reports in the *Mita hyōron*.

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bought enough of them to fill ten boxes to be shipped back to Japan. Later, with funds from an undisclosed source, he bought some fifty objects which could be clearly identified as being former museum treasures. These and all the movable objects remaining in the Institute of Ceramics and the Ku-kung ku-wu pao-ts‘un-so were taken to the Institute of History and Philology, where they were classified and stored away. The great Sinologist, SHINJŌ Shinzō 新城新藏 of the Shanghai Institute of Natural Sciences, died last summer while engaged in this work.[22]

MATSUMOTO's party also visited Hang-chou, where they made a scientific study of the nearby archeological site of Ku-tang 古蕩, from which they unearthed remains of many different ages. They reported that Hang-chou and the Buddhist monasteries in its vicinity were unscathed, but that the most valuable articles in the West Lake Museum (Hsi-hu po-wu-yüan 西湖博物院) were gone and that the Chekiang National Library has been emptied of its books.[23]

The extensive architectural repair work at Peking, which had progressed so well during the last years before the outbreak of hostilities and which had been brought to a halt by the war, was resumed last year by the Peking provisional government with the continuation of the reconstruction of the Kuo-tzŭ-chien 國子監 and the repairing of the Thirteen Story Pagoda of the Yung-ning-ssŭ 永寧寺.

The grottoes of Yün-kang have been in no way harmed during the war, and last spring Japanese experts under the nominal aegis of the local north Shansi government started to take active measures for their preservation by regulating visitors more strictly and erecting shelters to protect the caves from the elements. Last summer a party under MIZUNO of the Kyōto Tōhō bunka kenkyūjo 東方文化研究所, until recently known as the Tōhō bunka gakuin 東方文化學院, made what is said to have been the most thorough and careful study of the Yün-kang caves that has ever been undertaken. They made many measurements and rubbings and took photographs of the grottoes and their sculpture. They also removed the thick deposits of rubble and sand at the bases of the walls, thereby revealing many hitherto unknown bits of sculpture. Mizuno's party is expected to continue its activities at Yün-kang this year.

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[22] Cf. Prof. ELISSÉEFF's notice in *HJAS* 3.430. Before his death SHINJŌ was also engaged in an attempt to stop the destruction of a Nanking gate dating back to Ming times, which the Japanese military were razing in order to facilitate the landing of airplanes.

[23] MATSUMOTO was again in China in December and January of this winter, but I have seen no report of this second expedition.

Another archeological enterprise planned for the near future in the same Ta-t‘ung 大同 area is the excavating of P‘ing-ch‘êng 平城, a walled town of the Northern Wei period. This work will be undertaken by the Far-Eastern Archaeological Society.

From these sketchy indications of recent Japanese archeological activities in China, it seems quite clear that Japanese scholars are following up the military occupation of northern and central China by an archeological occupation of the Chinese terrain, and that they will soon be carrying on intensive excavation work, military conditions permitting.

AINU CONCEPTIONS OF ANIMISM

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By DR. JOHN BATCHELOR

> "The Ainu—a peculiar folk, remnant of which live in Hokkaido, Japan, part of Saghalien and have kinsfolk in the Ryukyu Islands. They are probably the remains of an old Proto-Nordic population once widely spread over Northern Asia." Encyclopaedia Britannica (latest edition)

I found it to be a firmly fixed belief among the old Ainu that no existing life ever ceases to be. By life they understood living spirit. Life was to them most natural and energetic.

With this people spirit was looked upon as the principle of life behind life—the very indestructible quintessence of being. This life having been once brought into existence always is and ever shall be. It cannot be seen though it may be heard as in thunder and in the rushing of the mighty winds. Its energy indeed may be seen and experienced as in ourselves and other phenomena of nature.

Ainu Expressions for Dying

The modes by which the Ainu express the idea of dying exactly agree with this. Thus, "to pierce the skies;" "to go to the lower regions;" "to make a clearance;" "to have space for thought;" "to go away;" "to leave behind;" "to be wound up with sleep;" "to sleep the other sleep;" "to go to the other world;" "to rest;" "to abdicate one's village;" "to have grown old and gone away."

The Ainu always appear to connect living spirits with some form of matter. Thus we frequently hear of them as existing in trees, animating storms, roaring in the thunder, dwelling in animal forms, going to and resting in the sun. Both gods and devils go to war, ride in chariots in the air and above the clouds, look out of human eyes, speak with human language and fight with swords and spears. Even the Creator Himself is conceived of as possessing a body like that of men. Yet this body, though spoken of as though it were matter which could be mutilated, destroyed and dissolved, is, on the other hand, also thought to consist of some indestructible substance. And this bodily substance being of such a nature, both gods and demons have the power of now appearing visibly to us and now making themselves invisible at will. Hence, too, when a god is slain in war the form of his living spirit ascends to the skies with a mighty sound.

But here again we should be careful to mark that the Ainu seem to distinguish between the various kinds of matter animated by the deities. Thus a god may appear localized and stationary as in a tree or locomotive, as in the bodily form of a man or even in a man-made steam engine, he may be cut down with a woodman's axe, or go to war and be slain; he may abide in a lake or rush along in a river. The destruction of the body, whatever its form may be, whether it be that of a stone, a tree, a brute beast, or a man, is merely stripping off the outer garment in which it is inclosed for the time being, to discover another beneath it. The spirit still retains its inner form and nature and lives on.

This enshrining of superhuman spirits in some bodily form is only natural to humanity as now constituted. Man's imagination has nothing to work upon in its thought creations but a very limited experience. When the finite mind desires to picture the infinite Being, whom it is surely unreasonable to suppose it can fully comprehend, there is no alternative left but to clothe it with limitations of form; and all form, since it cannot but be extended and so exist in space, must necessarily be limited in degree. The same law which has led the poet and the artist to express and image for us a Satan and an Abdiel, the Imp and the Cherub, has led the Ainu to picture God as a man, and to give claws to the devil. Thus allowances must be made for these Ainu sons of nature.

There can be no doubt, then, that the old Ainu people were animistic in their religious belief in the broadest sense of that term. To get a full definition and description of Animism with its connections with soul-life, organic life and inorganic life, its ancestor worship, its connection with necromancy, totemism and other superstitions, one must study the works of such writers as have endeavoured to give one. As for this article, it deals exclusively with a small part of that cult such as the writer has actually seen and been taught among the A le.

All Things Endowed with Life

When I first went to live among this people I found that in faith and actual daily practice they believed that all things which we call organic and inorganic are endowed with life, reason, intelligence, volition, and power identical to those possessed by man. Indeed, their faith was so broad that it embraced pantheism and pandemonism also. This does not mean to say that they considered any one life or spirit, whether good or evil, to be omnipresent, but that such were ubiquitous. Their ideas reminded me of a seething hive of bees, the bees being many but the hive one. Not only so, but the material out of which the hive was constructed is also a very much alive creature being made up of multitudes of spirits, some good and some evil. Such was their great Pan. I little thought when I first entered an Ainu hut that I was going into the bosom of a living creature. But it was not long before I saw that the people not only regarded their homes as dwelling places of the gods and of their divine ancestors, but that the building itself in every part was actually regarded as a living being!

Account of First House

The following traditional account of how the first house came to be, together with the instruction given as to how new ones should be built, will explain one phase of genuinely ancient Ainu belief respecting this matter. It is a very rugged and short piece of lore but it will be found interesting.

My informant said,—

"When a new house has been set up, the men should with prayer reverently make what are called *chisei sambe*, i.e. "house pulses" and hang them about the inside of the building." (These "pulses" are curled shavings of willow sticks about six inches long and are hung to the beams and poles and walls and treasures in all parts of the insides of the dwellings.) The willow tree is sacred among the Ainu, hence "The prayer said should be as follows:—"

'O Lady of the House, O Lady of the room' O Foster Mother, In ancient days Thou didst come down from heaven with the first house to care for us. The frame of that house was of wood and it was covered with grass. It also had the pulses already arranged in it when it came. (The Foster mother mentioned here is the goddess of fire and Ancestress of the people who has Her dwelling place in the fire upon the hearth).

"Then said the chief among the gods—'As for this house it shall be its duty together with the Fuji Ancestress to take care of the people. When the building becomes old another shall be built by the men in which children shall be born and brought up.' So spake the chief god. As this house has therefore now been set up and the pulses have already been properly arranged and set in order, henceforth shall you O House together with the Fire goddess bestow health on the family and watch over all of them. We have now offered unto ye good fetishes. Accept them and answer our prayers. From now on grant that no members of this household shall become ill or unfortunate. After such a manner shall the men offer up prayer."

Everything Indestructible

Now, the Ainu believe that no life of whatever kind, that no thing, in fact, can ever cease to be. Even by the material itself rotting the spirit never comes to naught. So in olden times the people used to set fire to the family hut when the senior grandfather died in order to send it to the nether world for him to occupy.

Before chief Penri's old mother died the family built a small lodge for her to occupy and when she passed away it was burnt up and in that manner sent after her for future use. I saw the poor little hut and saw the old lady in it and spoke to her. After the chief himself died his house, still having my old nine by six foot room in it, was committed to the flames. So the people still living may imagine the old fellow still in it and myself perhaps sitting on my tub getting what language I might out of him. Truly that poor hut is not my idea of a happy mansion above! I should want at least a back to my sake-tub seat. Truly the Ainu form of downright animism, with all its ramifications and implications is no easy matter to understand.

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FÜR DIE REDAKTION: Prof. Dr. A. Supan.   JUSTUS PERTHES' GEOGRAPHISCHE ANSTALT

Neue Beiträge

zur

Geologie und Geographie Japans.

Von

Dr. Edmund Naumann.

Mit drei Karten und zwei Skizzen im Text.

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Seinem

hochverehrten Lehrer und Freund

Herrn Oberbergdirektor Prof. Dr. **Wilhelm** Ritter **von Gümbel**

zum siebzigsten Geburtstag

dankbarst gewidmet

vom

Verfasser.

I.

Dampfausbrüche der japanischen Vulkane Shirane und Bandai.

Es war am 15. Juli des Jahres 1888, als sich um die achte Morgenstunde der Gipfel des Vulkans Bandai, eines 1840 m hohen, felsigen Kegels, der am Ufer des kristallklaren Sees Inawashiro aufsteigt, plötzlich öffnete, um das Land nach Nord und Ost mit einer kolossalen Masse von Schlamm und Felstrümmern zu überschütten. Nicht weniger als 461 Menschen verloren bei dieser furchtbaren Katastrophe das Leben. Über eine Fläche von 7000 ha hatte der Berg seine breiigen Massen ausgebreitet. Berichte und Abhandlungen von Augenzeugen haben ein ziemlich klares Bild über den Verlauf der Erscheinung geliefert. Es mag Wunder nehmen, wenn ich mich, ohne den Vorteil eines direkten Einblickes genossen zu haben, an den Versuch wage, die Katastrophe zu schildern und ihre Bedeutung klarzulegen. Ich glaube jedoch ein gewisses Recht zu diesem Versuch beanspruchen zu dürfen, da ich den Vulkan im Jahre 1878 selbst bestiegen habe. Durch diese Besteigung bin ich nämlich in den Stand gesetzt, die Verhältnisse, wie sie vor dem Ausbruch lagen, vielleicht besser zu beurteilen, als andre. Auch dürfte es von Interesse sein, hier die Eruption des Vulkans Shirane bei Kusats, welche am 6. August 1882 statt hatte, in Betracht zu ziehen. Auf Grund der seinerzeit an Ort und Stelle durchgeführten Studien vermag ich eine Darlegung dieses jüngsten Shirane-Dampfausbruches, über den noch nichts Ausführliches bekannt geworden ist, zu bieten. Die beiden Dampferuptionen sind auf das Innigste verwandt; sie müssen auf dieselben Ursachen zurückgeführt werden. Schon deshalb dürfte es sich empfehlen, sie gemeinschaftlich zu behandeln.

1. Der Shirane-Ausbruch.

Über die Lage des Shiranesan und die topographischen und geologischen Verhältnisse seiner Umgebung liefern zwei Sektionen der 200000teiligen Gradabteilungskarte der Kais. japan. Geologischen Reichsanstalt: Blatt Ueda, Zone 11, Col. XI, und Blatt Nagano, Zone 12, Col. XI, ein anschauliches, gutes Bild.

Folgt man von der bekannten, am Rande der Ebene von Yeddo gelegenen Nakasendostadt Takasaki aus einer nordwestlichen Richtung, um das Thal des Karasugawa hinaufzuziehen, so macht sich schon bei Kameyama das Gebirge geltend. Aus tertiärem Hügellande tauchen hie und da jäh emporsteigende, felsige, waldgekrönte Pyramiden vulkanischen Gesteins auf, oder auch hochzackige, schnell endende Rücken und runde Dome. Gar wundersame Bilder zeigen sich dem staunenden Auge, wenn diese fremdartigen Berggestalten durch irgendeine Seitenschlucht nach unten schauen. Nicht lange dauert es, so befinden wir uns im Zentrum eines riesigen, nach Osten offenen Halbkreises mächtiger Vulkane. Im Südwesten liegt der rauchende, flache Kegel des Asama (2480 m), gegen Westen erscheint der gewaltige, in einer schlanken Felsspitze gipfelnde Adzuma (2357 m), weiter der breite, plump geformte Manza, und zuletzt, nordwestlich von unserm Standpunkt, der bleiche, von grünen Rücken getragene Shirane (2253 m), über dem sich eine dünne weiße Dampfsäule von dem blauen Himmel abhebt. Durch das Adzumagawa-Thal, in dessen schattige Felsenschluchten wir nun hinabsteigen, wälzte sich vor 100 Jahren ein dem Asama entquollener Lavastrom, der Wälder und Dörfer verschlang. Er floſs bis zum Tonegawa, also vom Krater aus nicht weniger als 63 km weit.

Kusats ist ein altes, berühmtes Schwefelbad, das sich in jedem Sommer groſser Frequenz erfreut. Der Ort hat umfangreiche Badeanlagen und zahlreiche Theehäuser. Aus den Bädern steigen groſse Dampfmassen auf. Heiſse Quellen finden sich in Unzahl über die ganze Umgegend zerstreut. Kusats verdient in vollem Maſse den Namen einer Solfatare. Einige der Quellen setzen Schwefel ab, an vielen Punkten macht sich ein starker Geruch nach Schwefelwasserstoff bemerkbar. Die meisten Thermen folgen dem von Westen her einmündenden Thale. Hier reihen sie sich in Form einer langen Kette aneinander. Das Thal trägt den Namen Sainokawara, d. i „Trockener Fluſs der Seelen“, — eine Benennung, welche auf religiöse Beweggründe zurückzuführen ist. Steinhaufen, welche sich in dem Thale vielorts finden, sind von buddhistischen Pilgern aufgetürmt. Die Steine werden den verstorbenen Kindern dargebracht, um sie vor der alten Hexe Shōdzkano Baba zu retten, die am Ufer des buddhistischen Styx ihrer wartet, um die armen Opfer zum Steineaufhäufen ohne Ende anzutreiben.

Von groſser Verbreitung ist in Kusats und Umgegend eine weiſse Breccie mit faust- bis kopfgroſsen Einschlüssen eines durch Zersetzung weiſsen Augitandesits. Die Breccie wird von Brauneisenerzbänken, in denen sich unzählige Blätterabdrücke und sonstige Pflanzenüberreste finden, überlagert. Die Limonitbänke, offenbar Ablagerungen von Thermenwässern, sind auſsen härter, innen weicher und bilden malerische, knorrige, gelbschwarze oder sepiabraungefärbte Felsen. Die Quellen treten überall im Liegenden des Erzes auf. In gewissen Lagen zeigen die letztern eine eigentümliche Textur, die auf den ersten Blick einfach querfaserig erscheint. Bei genauer Untersuchung erweisen sich jedoch die Querfasern als Ketten übereinandergestülpter winziger Kegelchen.

Der Weg nach dem Shirane folgt dem Bache des Dorfes kaum ebenso weit, wie die Häuser reichen, windet sich schnell am Hange rechts bergauf und führt so auf den Rücken einer weit ausgedehnten Hara, einer jener sanft ansteigenden Ebenen mit heideartiger Vegetation, deren es, besonders in der Umgebung der Vulkane, viele im Lande gibt. Bald geht es nun wieder hinab in die Schlucht des Yasawagawa, an dessen jenseitigem Ufer steile, pfeilerförmige, mit Nadelhölzern gekrönte Felsen emporwachsen. Solche aus pfeilerartigen Felsen gebildete Wände treten in der Umgebung des Vulkans sehr viel auf. Sie gehören zu alten Lavaströmen. Wir betreten von neuem den Rücken der Hara, die sich nun mehr und mehr zusammenschnürt. Durch das Aneinandertreten der vor uns liegenden Bergriegel werden dann zwei Thalwege eng aneinandergezwängt, so daſs man bei Verlassen der Hara einen scharfen, brückenartigen Grat betritt, während beiderseits tief unten die brausenden Wässer hörbar werden. Bald stehen wir einer Schlucht gegenüber, die sich in ein Gewirr von, wie es scheinen will, an- und durcheinandergeschobenen, groſsenteils bewaldeten Massen und Kuppen verläuft. Die Krone dieses Gewirrs von Bergen bildet eine kahle, flache, lichtfarbige Schwelle: der Shirane, der weiſse Berg. Der Weg führt weiter in nordnordöstlicher Richtung bis zu einem Theehaus, dem Shirane Chaya, auf der Yoshigadaira, einer kleinen Hochebene, gelegen. Wir haben uns nun links zu wenden, um die kahlen, rauchenden Höhen des Berges zu besteigen. Der Vulkan markiert sich hauptsächlich durch sein bleiches Gewand und hebt sich durch seine Form kaum von den umgebenden Erhebungen, mit denen er innig verwachsen ist, ab. Selbst hier oben erscheint er wie ein lang hinziehender Wall. Er ist einem sehr stark abgestumpften, lang-elliptischen Kegel zu vergleichen. Die Gipfelregion ist plateauförmig. In sanft geschwungenen Wellen taucht die Oberfläche auf und nieder, so daſs es schwer hält, den höchsten Punkt ausfindig zu machen. Südsüdöstlich vom Shirane ist auf der Karte der Reichsanstalt ein 2143 m hoher Gipfel mit Namen Moto-Shirane verzeichnet. Dieser Gipfel soll nach der Karte einen Krater tragen. Der Gipfel des eigentlichen Shirane liegt in einer Entfernung von 6 km westnordwestlich von Kusats.

So einförmig die Gestaltung des Vulkans und besonders die Form seiner Gipfelregion auf den ersten Blick erscheinen mag, so interessant sind die Kraterbildungen, von denen drei in der Richtung Südwest—Nordost aneinandergereiht sind. Die mittlere der drei kesselförmigen Vertiefungen, Yugama genannt, ist die gröfste und tiefste, die nordöstlichste, Mizugama, mit einem Teich versehene, die kleinste. Der südwestliche Kessel trägt den Namen Karagama. Die Terrainverhältnisse sind auf der der Abhandlung beigelegten Karte zur Anschauung gebracht.

Auch in der Mitte von Yugama soll sich früher ein Wasserbecken befunden haben; jetzt ist dieser kesselartige Krater der Schauplatz einer sehr seltsamen Thätigkeit. Aus mächtigen Spalten, die an den felsigen und schlammigen Wänden klaffen, pfeifen unter Zischen und Sausen Dampfstrahlen und Dampfwolken hervor. In einigen rauchenden Tümpeln am Grunde des Kessels quirlt und sprudelt es, wie wenn das Wasser kocht. Am Fufse der östlichen Steilwand aber bäumt sich die Flut in riesigem Schlote, um nach jedesmaligem Aufsteigen unter wildem Gewoge und Schäumen nach allen Seiten zu stürzen. Immer von neuem verkündet das Anwachsen des Geheuls ein wiederholtes Aufsteigen der gewaltigen Fontäne.

Der höchste Gipfel dürfte der auf der Nordseite sein, derselbe, dessen flach abfallende, in den Krater eintretende Rippe zwischen die beiden nordöstlichen Trichter des ganzen Kratersystems zu liegen kommt. Er erhebt sich 74 m über den Yugamaboden. Der felsige Gipfel östlich vom Mizugama, südlich vom Eingang zum ganzen Kratersystem, ist 70 m über demselben Niveau gelegen. Der südliche Kraterrand ist relativ niedrig und steigt ziemlich gleichmäfsig in nordöstlicher Richtung an. Sehr hoch und felsig erscheint dagegen die nördliche Wand von Yugama. Mizugama liegt 20 m über Yugama. Karagama dürfte nicht viel höher als Yugama liegen. Steigt man von Mizugama über den trennenden Sattel nach Yugama hinunter, so gilt es zunächst, an einer aus Schlamm und Felsmassen bestehenden Steilwand hin zu klettern, um in die nordöstliche Ecke des Kessels hinab zu gelangen. Hier befindet sich eine Dampföffnung, welche mit grofser Gewalt und unter heftigem Getöse kolossale Dampfmassen ausstöfst. Die Öffnung gehört zu einer grofsen, unterhalb des höchsten Gipfels hinziehenden Spalte, an deren Grunde sich siedendes Wasser zu befinden scheint. Ich vermochte der Öffnung ziemlich nahe zu kommen, mufste aber zurückprallen, als sich die Richtung des Stofses plötzlich änderte, um mich in einen glühend heifsen Dampfstrahl zu versetzen.

Wir begeben uns nun weiter hinab und gelangen auf den Boden einer kreuzförmigen Vertiefung, welche die nordöstliche Ecke des Mittelkessels einnimmt. Dieselbe ist fast durchgehends durch steile Wände begrenzt. Der östliche verbreiterte Arm der kreuzförmigen Vertiefung führt direkt in den im Horizontalschnitt hufeisenförmigen Eruptionsschlot hinein. Eine breite Spalte mündet in die westliche Bucht des Schlotes. Der Boden dieser Spalte liegt dort, wo sie an dem steilen Rande des Kraters abbricht, in ca 5 m Höhe über der Oberfläche des scheinbar siedenden Wassers. Ich operierte von hier aus, um Proben der schlammigen Flüssigkeit zu gewinnen und die Temperatur zu bestimmen. Leider mifslang die Temperaturbestimmung, da das Maximumthermometer an einer aus dem Krater aufragenden, nur von Zeit zu Zeit auf einen kurzen Augenblick sichtbaren Felsspitze zerschellte. Dagegen glückte die Füllung einiger Flaschen mit Kraterwasser. Es war nicht ungefährlich, diese Versuche in der ebenso abschüssigen wie schlüpfrigen Spalte auszuführen. Ich wurde durch meine hinter und über mir stehenden Gehilfen an einem Seile gehalten. Nur von Zeit zu Zeit, in kurzen Intervallen, gestattete der sich in dichten Wolken ballende Dampf freien Ausblick. Die in den Pfuhl geworfenen Flaschen waren wie die daran befestigten Steine so heiſs, daſs man sie nicht mit bloſser Hand zu fassen vermochte, obwohl sie nur ganz kurze Zeit mit dem erhitzten Wasser in Berührung gewesen waren. Dennoch glaube ich nicht, daſs die Temperatur im Krater den Stand von 100 Grad erreichte. Das Siedegeräusch, welches nach dem Zusammensinken des Wassers plötzlich eintritt, entsteht durch das Entweichen der Luft, mit der sich das Wasser beim Aufsteigen und Zurücksinken gemischt hat, und die heftigen Bewegungserscheinungen in dem Wasser rühren nicht vom Kochen, sondern davon her, daſs sich groſse Massen ausgestoſsenen Dampfes durch das Wasser hindurchzuarbeiten haben.

Was die Aufeinanderfolge der geysirartigen Eruptionen betrifft, so kann nicht mit voller Sicherheit angegeben werden, nach welchen Zwischenräumen dieselben statt hatten, der riesigen Dampfwolken wegen. Über eine sehr schnelle Aufeinanderfolge besteht allerdings kein Zweifel. Die Zwischenräume sind manchmal länger, manchmal kürzer. In einem Falle vermochte ich ein Intervall von einer Minute festzustellen.

Der östliche Teil des Eruptionsschlotes enthält milchiges Wasser, das sich in flieſsender Bewegung befindet. Es strömt fortwährend nordwärts, zeigt aber keineswegs das Kochen und Sprudeln, Aufwallen und Aufbäumen des westlichen Teiles. Auch ruht auf dieser Wasserfläche keine konstante Dampfsäule, so daſs sie meist sichtbar ist.

Das periodische Aufsteigen der Riesenfontäne erfolgt in der westlichen Abteilung. Es ist jedesmal, als ob sich die ganze, in unergründlichem Schlote enthaltene Wassermasse hoch emporbäumte, um gleich darauf ohnmächtig in sich selbst zurückzusinken, wobei sich das mit dem Aufbäumen verbundene Geheul und Gebraus allmählich zu zischendem Siedegeräusch herabstimmt.

Durchschreitet man den Kessel, um sich in die südwestliche Ecke zu begeben, so kreuzt man zunächst das Zentralgebiet des Yugama, welches vor seiner jetzigen Eruption von einem seichten Wasserbecken eingenommen wurde. An Stelle des Teiches ist jetzt eine Schlammwüste getreten, die durch eine lavastromartig zerrissene Oberfläche ausgezeichnet ist. Rechts von ihr im nordwestlichen Teil vom Yugama finden wir einen kalten Tümpel, der bis zum Fuſse der felsigen Hauptkraterwand heranreicht. In der Spitze des nordöstlichen Zipfels dieses Tümpels klafft eine kurze Spalte, gleichfalls der Sitz vulkanischer Thätigkeit. Unter hohem Druck strömt Dampf mit lautem Getöse aus einigen Öffnungen der steilen Felswand. Im untersten weiten Teile der Spalte siedet und kocht es wie im Eruptionskrater.

Der Krater des Shiranesan ist schon seit langer Zeit ein Gewinnungsort für Schwefel. Auch bei Gelegenheit meiner zweimaligen Besteigung fand ich Leute im Krater mit der Schwefelgewinnung beschäftigt. Eine kleine, kaum mannshohe Hervorragung in der nördlichen Hälfte des Yugama zeigte eine kompakte Masse sehr reinen Minerals. Jetzt dürfte sie schon längst dem Abbau unterlegen sein. Die meisten Stellen des Schwefelhügels zeigen noch die von der letzten Eruption herrührende Schlammkruste. Ein kreisrundes tiefes Loch befindet sich südlich vom jetzigen Yugama-Teich; dasselbe wurde früher zum Zwecke der Schwefelgewinnung abgeteuft.

In der südlichen Ecke befinden sich einige heiſse Sprudel; unter ihnen zeichnet sich der eine durch etwas gröſsere Dimensionen aus. In diesen kleinern Eruptionslöchern zeigt sich die in der Hauptvertiefung so groſsartig auftretende Erscheinung im kleinen, nur mit dem Unterschiede, daſs hier das periodisch wiederkehrende Aufbäumen des Wassers nicht so deutlich hervortritt[1]). Besonders ist es in den kleinern Herden nur eine wirbelnde, sprudelnde Bewegung. Das Entweichen von heiſsem Wasserdampf erfolgt hier aus einer von erhitztem schlammigen Wasser gefüllten, in der Regel kreisrunden, trichterförmigen Öffnung. In einem dieser kleinern Sprudel wurde die Temperatur mit Hilfe des Maximumthermometers zu 83,5° C. bestimmt. Hier lag also bestimmt kein kochendes Wasser vor. Die kleinern Sprudeltrichter erinnerten mich lebhaft an die Solfatare des Tateyama. Hinter den kleinern Sprudeln liegen auf dem Rücken zwischen Karagama und Yugama verschiedene Dampföffnungen, auch direkt südlich von den Sprudeln ist dies der Fall. In der Nähe der Sprudel (östlich davon) liegt ein kleiner Teich mit kaltem Wasser.

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[1]) Die Erscheinung des stoſsweisen periodischen Austretens der Dampfmassen findet in sehr vielen Solfataren statt, in der Regel da, wo der Eruptionskanal der Dämpfe mit Wasser gefüllt ist. Auſser solchen Miniaturgeysirn habe ich auch die Bildung kleiner Schlammkegel beobachten können (Tateyama), die dadurch emporwuchsen, daſs bei Gelegenheit der Dampfstöſse jedesmal schlammiges Wasser emporgeschleudert wurde, welches sich beim Niederfallen um die Öffnung ausbreitete.

Der Kocho (Schulze) von Kusats hat sich in hohem Maſse um die Kenntnis des jüngsten Shirane-Ausbruchs verdient gemacht. Er zeichnete in ein von frühern Vermessungen des Kraters herrührendes Croquis (Maſsstab 1 : 6000) die Veränderungen ein, die infolge des neuen Ausbruchs mit dem Krater vorgegangen waren, und begleitete diese Darstellung mit einem Bericht an das Guma-Kencho, dessen Übersetzung nachstehend folgt:

„Wind und Regen herrschten vom 5. August bis zum folgenden Tage, an welchem sie mit immer gröſserer Heftigkeit auftraten. Am 6. vernahm man um die erste Stunde nachmittags eine heftige Detonation; Shiraneyama am Gipfel des Shirane, der früher zur Schwefelgewinnung gedient hatte, explodierte und stieſs Dampf, Schlamm und Steine hoch in die Luft. Der Schlamm ergoſs sich zur Tiefe, mündete in den Dokusuigawa am Shibutoge (Weg nach Shinshiu) und riſs viele Brücken fort, so daſs die Straſse für einige Zeit unpassierbar wurde. Die Schäden fanden baldige Ausbesserung, aber Rauchmassen entstiegen fortdauernd dem Gipfel des Shirane. Ich begab mich in Begleitung weniger Personen selbst nach dem Gipfel und sah ungefähr neun Stellen, an welchen Dampf, Schlamm und Steine emporgeschleudert wurden. Die groſsten Auswürflinge erreichten 0,6 m im Durchmesser und kamen in ungefähr 2000 m Entfernung zu Boden. Als ich die Erscheinung beobachtete, wurden viele Steine ungefähr 60 m hoch emporgeschleudert, so daſs es sehr gefährlich erschien, den Öffnungen nahe zu kommen, und von einer Untersuchung dieser Öffnungen Abstand genommen werden muſste. Ich kann daher nur auf die beigeschlossene rohe Kartenskizze verweisen."

Nach den mündlichen Mitteilungen des Kocho habe ich Folgendes festgestellt:

„Am 6. August, nachdem es am 4. und 5. stark geweht und geregnet hatte, wurde zu Yoshigadaira ein gewaltiger Donnerschlag vernommen, der vom Krater des Shirane kam. Am Abend desselben Tages begab sich ein Einwohner von Kusats, der auf dem Wege nach Shinshiu war, nach dem Gipfel, kehrte aber, auf dem Kraterrande angekommen, wieder um, da ihn die Furcht faſste; er sah nichts als Dampf. Am Morgen des 7. kam der Sekretär des Kencho in Kusats an, um die Straſse zu inspizieren. Folgenden Tages bestiegen Kocho und Sekretär den Berg. Es war unmöglich, den Kraterboden zu begehen, da der Schlamm zu weich war und die Gefahr des Versinkens zu groſs. Der Schlamm hat früher nicht existiert, der ganze Krater war vielmehr mit einem weiſsen Sande ausgekleidet. Der Schlamm entstammt dem groſsen neugebildeten Wasserkrater. Der Kocho sah Dampf und emporgeschleuderte Steine; letztere wurden ungefähr 60 m hoch geworfen. Kleine Steine sind ungefähr 2000 m weit geschleudert worden, groſse Steine ca 550 m weit. Die gröſsten der ausgeworfenen Steine waren ungefähr 0,60 m lang, 0,30 m breit. Die meisten wurden nach NW geworfen und fielen auf dem Abhange des Berges nieder. Nur während der ersten 5—6 Tage wurden Steine ausgeworfen. Am 10. ging ein Mann hinunter in den Krater; die Leute sagten, er könne nicht recht bei Sinnen sein, da er das Leben so leichtsinnig aufs Spiel setze. Vor der Eruption war von heiſsem Wasser und von Dämpfen am Gipfel nicht die Spur vorhanden, da herrschte vollständige Ruhe. An der Südostseite des Berges bildeten sich am Mittag des 9. August vier Öffnungen; diesen entquoll heiſses Wasser. Die gröſste der Öffnungen hatte einen Durchmesser von 5,5 m. Die Öffnungen, jetzt noch zu sehen, liegen in der Nähe der Kraterkante. Das ihnen entströmende Wasser war sehr heiſs. Diese heiſsen Quellen flossen nur bis zum 16. August, jetzt stoſsen sie Dampf aus.

Die Dampföffnungen sind jetzt weniger zahlreich als ehedem. Einige neue wurden gebildet, mehr jedoch gingen ein. Vor 70—80 Jahren soll eine ganz ähnliche Eruption stattgefunden haben.

Am 9. stieg Yamaguchi Kobachi in den Krater hinab und umging einen Teil des Schlotes. Der südwestliche Teil des Kessels war ganz unpassierbar."

Auch bei den Bewohnern des Theehauses von Yochigadaira zog ich Erkundigungen ein; sie sagten Folgendes aus:

Am 6. 1 Uhr nachmittags erscholl kolossales Getöse, von lebhaften, im Theehause sich mit groſser Heftigkeit fühlbar machenden Erschütterungen begleitet. Das Getöse glich mächtigen Kanonenschlägen. Im Laufe einer Stunde erfolgten vier Detonationen. Die Steine sind nicht bis Yochigadaira geschleudert worden, doch hörte man im Theehause das Niederfallen der Blöcke in der Nähe, auch war ein lebhaftes Geheul vernehmbar. Beim Theehause fiel übrigens nicht einmal Schlamm. Die Kleider der Reisenden, die von Shinshiu kamen, waren mit Schlamm bedeckt. Nach den Mitteilungen dieser Leute regnete es Schlamm, als sie sich etwa 1100 m von hier nach Shinshiu zu befanden.

Der 5. war durch reichliche Niederschläge ausgezeichnet, der 6. ging regenlos vorüber, dagegen herrschte starker Nebel an diesem Tage, so daſs man nichts zu sehen vermochte. Vom 7. an war das Wetter schön. Nach Angabe des Theehauswirtes in Yochigadaira bäumte sich das Wasser im Krater über 30 m hoch.

In dem Thermenbade Shibu (7 Ri von Ksatsu) hielt sich eine Amerikanerin auf, die sich vorher in Kusats befunden hatte. Selbige teilte mir mit, daſs sie den Berg am 10. bestiegen und noch an diesem Tage die Steinauswürfe beobachtet habe.

In verschiedenen Zeitungsberichten ist seinerzeit von flammendem Feuer, glühender Lava und Aschenregen die Rede gewesen. Man sieht hieraus, mit wie groſser Vorsicht solche Berichte beurteilt werden müssen, und daſs auch das Material über historische Eruptionen nicht ohne die strengste Kritik hingenommen werden darf. Vorgänge wie der beschriebene haben an andern Vulkanen unzweifelhaft in groſser Häufigkeit stattgefunden. Es fehlen darüber bestimmte Überlieferungen, weil die Beobachtungen unzureichend oder übertrieben sind.

Die Gesteinsmasse, welche vor der Eruption den Raum des Yugamaschlotes eingenommen hat, muſs wie ein Champagnerpfropfen in die Luft getrieben worden sein, um in tausend und abertausend Splitter zu zerstieben. Das fein zerriebene Material senkte sich wie ein Regen von Asche auf die weiter abgelegenen Regionen nieder. Die Steinklötze fielen meist auf den Kegelmantel und bohrten sich hier in den Boden ein. Als ich den Berg bestieg, sah ich noch viele solcher in die Erde eingewühlten Blöcke.

Merkwürdigerweise zeichnet sich die Gegend von Kusats, also das Land am Fuſse des Berges, seit Langem durch eine sehr rege Solfatarenthätigkeit aus. Am Gipfel, wo die Explosion stattfand, hat es indessen bis zur Katastrophe weder Fumarolen noch Thermen gegeben; das ganze Kratersystem lag vollständig ruhig. Der jüngste Ausbruch ist ebenso wie der weiter unten zu beschreibende des Bandai auf eine Explosion zurückzuführen. Auf dem alten verstopften Kanal des Shiranekraters müssen sich Dämpfe emporgearbeitet haben. Diese Dampfmassen müssen schlieſslich auf die den Kraterboden auskleidenden, zum Teil schlammigen, einen sehr dichten Verschluſs bildenden Sedimentmassen einen so gewaltigen Druck ausgeübt haben, daſs sie im stande waren, sich frei zu machen. Eine cylindrische Masse, aus Fels, Schutt, Schlamm und Sand bestehend, ca 200 m im Durchmesser, flog in die Luft. Die scharfe und bestimmte Abgrenzung des Eruptionsschlotes und die senkrecht abfallenden Wände desselben mit ihren frischen Aufreiſsungen sind Beweis für die paroxysmische Entstehung. Die Explosion muſs mit einer furchtbaren Energie erfolgt sein. Keine Schuttmassen, keine Felsblöcke finden sich in der Nähe des Schlotes. Es macht ganz den Eindruck, als sei die ausgesprengte Masse zu Staub zerstoben.

Die Schlammüberzüge auf Gras, Gesträuch und Bäumen, welche vom Ausbruch herrühren, konnte ich auf dem Wege nach Shibu noch in ca 5 km Entfernung vom Krater nachweisen. Die Gesteinsblöcke sind bis 2 km weit geschleudert worden. Auf dem Shirane-Abhang zeigen die Pflanzen, welche sich hier in spärlicher Entwickelung finden, weifse bis bläuliche Überzüge, wodurch der sehr mangelhaften Vegetation eine ganz eigentümliche Physiognomie verliehen wird. Die gröfsten Massen des feiner zerriebenen Materials sind in gröfserer Entfernung vom Krater ausgebreitet worden.

Der Shirane-Gipfel zeigt drei ihrer Entstehung nach verschiedenartige Massen: Schutt, Schlamm und Fels. Ersterer, aus dem stark geklüfteten Andesitgipfel hervorgegangen, bedeckt Höhen und Hänge und ist von grober Beschaffenheit. Besonders ist es an den äufsern Hängen des Kegels, wo er meist aus gröfsern eckigen Fragmenten besteht. Der Schlamm (wir fassen unter diesem Namen alle geschichteten Bildungen des Shirane-Gipfels zusammen) füllt die tiefern Teile, d. h. die drei Kessel Mizugama, Yugama und Karagama, und wir könnten wohl unterscheiden zwischen solchen Schlammmassen, die durch frühere Eruptionen gebildet wurden, solchen, die sich aus den kalten Teichen der Kessel niederschlugen, und ferner den neuesten Bildungen dieser Art, die ihre Entstehung dem jetzigen Ausbruche verdanken. Deutlich geschichtete Massen finden sich nicht nur als Kesselfüllungen; auch die südliche Wand des Yugama zeigt unverkennbare Schichtung. Doch weisen die Kraterkliffe dieser Teile recht grobe Materialien auf, wahrscheinlich gebildet durch eine Mischung von Schlamm und Schutt bei Gelegenheit früherer mächtigerer Wassereruptionen. Die kreuzförmige Vertiefung in der Nordostecke des Yugama zeigt an den steilen Wänden interessante Profile, die einen höchst belehrenden Einblick in die Struktur der Yugamafüllung bieten. Es ist hier allenthalben alter geschichteter Schlamm zu sehen, stellenweise mit Sand gemischt, oder in einzelnen Schichten mit Sand wechselnd, andre Schichten dicht gefüllt mit kleinern Fragmenten oder vereinzelte gröfsere Blöcke aufweisend. In diesen Schlammablagerungen tritt Schwefel auf, entweder in Form von Lagern, die bis ca 0,2 m mächtig werden und in der Regel mit Schlamm vermischt an der Schichtung teilnehmen, oder in der Form von Gängen, wie es in dem weiter oben erwähnten künstlichen Schwefelloch in der Nähe des Teiches sehr schön beobachtet werden kann. Etwas verzweigte, zum Teil ziemlich dicke Querschnitte schön gelb gefärbter Schwefelgänge ziehen an den Wänden steil aufwärts. Die Schwefelablagerungen müssen durch Solfatarendämpfe erzeugt worden sein. Die Bildung von Schwefel aus Dämpfen kann man in verschiedenen Solfataren Japans direkt beobachten; so sah ich eine Dampföffnung in der Tateyamasolfatare (Ojigoku), die sich mit einem herrlichen, halbmannshohen, schlankgestalteten und aus zahllosen Tausenden glitzernder Schwefelkriställchen aufgebauten Kelch geschmückt hatte.

Jetzt ist von derartigen Vorgängen am Shirane-Gipfel nichts zu bemerken. Der Schwefel spielt hier, wenn er überhaupt in irgend nennenswerter Quantität als Exhalation vorkommt, eine durchaus untergeordnete Rolle. Aus dem Hauptschlote sowohl wie aus den kleinern Öffnungen und Sprudeln entsteigen gasförmige Massen, wahrscheinlich reine Wasserdämpfe.

Die Gesamtmächtigkeit der den Yugama füllenden Schlammablagerungen wird an die 12 m betragen. Was die Lagerungsverhältnisse betrifft, so sind die Schichten durchgehends horizontal; Dislokationen wurden nicht beobachtet.

Ein Zuwachs der Yugama-Schlammfüllung hat infolge der letzten Eruption stattgefunden. Die Kratertiefen, nach Aussage des Kochos früher mit einem feinen Sand ausgekleidet (jedenfalls ist es der Wind gewesen, der diese Sandauskleidungen erzeugte, indem er die feinern Bestandteile des an der Oberfläche sich häufenden Zertrümmerungsschuttes in die Tiefe hinabwehte), sind jetzt allenthalben mit einer meist noch weichen, überall mit Austrocknungsrissen versehenen Schlammkruste überzogen. Die Dicke dieser Schlammkruste ist in verschiedenen Teilen des Kraters sehr verschieden. Der Stellen, an denen sie gemessen werden kann, gibt es freilich nur wenige, doch dürfte die Mächtigkeit im Durchschnitt nicht unter 0,30 m betragen. Durch Studium der Austrocknungsrisse ist es möglich, zu einem ungefähren Begriff über die Dicke der Schlammkruste zu gelangen. Dieselben reichen an den meisten Stellen sehr tief hinein. Sonst sind, eine Anzahl von Punkten ausgenommen, an welchen direkte Messungen durchführbar sind, wenig Anhaltspunkte vorhanden, da sich die jüngsten Auswurfsmassen von den ältern kaum unterscheiden. Auch tritt der Umstand hinderlich heran, daſs die obersten Schichten der ältern Schlammabsätze durch die wiederholt stattgehabten Überflutungen etwas durchweicht erscheinen. Am mächtigsten tritt die Überdeckung jedenfalls im Westen vom Eruptionsschlote auf, wo sich die oben erwähnte Schlammwüste in radialer Richtung zu dem Ausbruchszentrum ausdehnt. Die Dicke erreicht hier 1—1,3 m.

Das eigentliche Gefels des Shirane versteckt sich meist unter Schutt und Schlamm. Wo es hervorschaut, zeigt es sich in auſserordentlich hohem Grade zerklüftet. So an der Felswand südlich vom Eingang. Fest und trotzig steigen die steilen, von den schäumenden Wellen der heiſsen Flut bekämpften Felsen der südlichen Schlotwand empor. Auch unten im Schlote zeigt sich Gefels, die Ufer bildend und dem überlagerndem Schlamm eine Stütze bietend. Felsen finden wir am Fuſse des höchsten Gipfels, längs der Steilwand, zu deren Füſsen sich der gröſsere kalte Teich ausbreitet, sowie in der südöstlichen Ecke. Es ist bemerkenswert, daſs sich die Dampföffnungen immer da zeigen, wo die Schlammausfüllung an das Felsenmark des Berges grenzt. Dies beweist, wie schwer der Widerstand, den die zähe, thonartige Masse des Yugama der von unten ankämpfenden Kraft entgegensetzte, zu überwinden war.

Ich bestieg den Shirane zweimal, erst am 5., dann am 7. September. Am 6. hatte sich die ganze Gegend in dichten Nebel gehüllt, so daſs ich es vorzog, in Kusats zu bleiben, um dem Sainokaware einen Besuch abzustatten. Die Besteigung am 7. verband ich mit dem Marsch nach Shibu (22 km von Kusats entfernt). Es war dies eine ziemlich anstrengende Tour, da ich die Strecke bis Shibu topographisch und geologisch aufzunehmen hatte.

Am 5. stieg die Yugama-Fontäne etwa 4 m hoch, am 7. 6 m. Die groſse Dampfspalte unter dem höchsten Gipfel arbeitete am 7. viel heftiger.

Die letzte Eruption scheint Niveauveränderungen herbeigeführt zu haben. Früher befand sich ein Wasserbecken im mittleren Teile des Yugama. Jetzt ist der mittlere Teil nicht mehr der tiefste, sondern höher als die peripherischen Abschnitte. Ohne Zweifel haben auch die in verschiedenen Teilen des Kessels mit sehr verschiedener Mächtigkeit erfolgten Schlammablagerungen das ihrige dazu beigetragen, den Kraterboden in verschiedener Weise zu erhöhen. Dennoch muſs das Bersten des Kessels eine, wenn auch geringe, Erhebung des mittleren Teiles zur Folge gehabt haben. Es darf dies als durchaus sicher hingenommen werden, da an einer zentral gelegenen Stelle die Sedimente des alten Yugamateiches höher liegen, als der Grund des nordwestlichen Teiches.

Die chemische Untersuchung der dem Shirane entnommenen Proben ergab folgende Resultate:

Schlammwasser des Yugama-Schlotes.

Spezifisches Gewicht der Mischung	1,078
Prozentgehalt der Mischung an festen Bestandteilen	7,94
mit einem spezifischen Gewicht von	2,434

Flüssige Teile:

Gesamtrückstand bei 150°	= 2,18 %
Cl	= 1,86 %
SO_3	= 0,93 %

Analyse des in dem Yugama-Schlote suspendierten Schlammes.

$Si\,O_2$ . . . . = 67,67
$Al_2\,O_3$ . . . . = 15,73
$Fe_2\,O_3$ . . . . = 0,84
$Ca\,O$ . . . . = 0,94
$Mq\,O$ . . . . = 0,82
$Ka_2\,O$ . . . . = 0,55
$Na_2\,O$ . . . . = 0,68
Glühverlust . . . . = 12,95
= 100,18

In 100 Teilen der Flüssigkeit waren enthalten an gelösten Bestandteilen:

$Al_2\,(SO_4)_3$ . . . . = 1,33
$Al_2\,Cl_6$ . . . . = 0,79
$Ca\,Cl_2$ . . . . = 0,72
$Na\,Cl$ . . . . = 0,38
= 3,22
Freie HCl . . . . = 0,57
Rückstand . . . . = 2,18.

Dies stimmt mit der obigen Zahl 3,22% überein, da beim Eindampfen die Schwefelsäure die Salzsäure austreibt und Thonerde als solche zurückbleibt.

Von grofsem Interesse ist hier der hohe Gehalt an freier Salzsäure[1]).

2. Die Bandai-Katastrophe.

Vor 17 Jahren — in der Mittagsstunde des 15. August 1876 — stand ich auf dem Gipfel des Bandai, eines Vulkans, der auf dem Nordflügel der japanischen Hauptinsel (Honshiu) unter 37° 35,6′ N. Br. und 140° 2,8′ Ö. L. gelegen ist, etwa gleichweit von den beiderseitigen Küsten entfernt, ungefähr 200 km nördlich von Tokio. Es war ein sonnenklarer, drückend heifser Sommertag. Kein Lüftchen regte sich. Rings unten lag alles so ruhig da, als ob die Natur in tiefem Schlafe liege. Nordöstlich und östlich vom Gipfel, tief am Fufse der jäh abstürzenden Felswand, lag, von waldigen Zacken und Hügeln umkränzt, ein weiter, flacher, mit dunkelblauen bis schwarzen Seen und Lachen übersäter Kessel. Nach Aussage des Führers sollten nicht weniger als 48 dieser Miniaturseen vorhanden sein. Wie zerbrochene Zähne des Vulkanrachens entstiegen dem Abgrunde zu meiner Linken zwei rissige, schlanke Felsensäulen. An die höchste Spitze des Berges, an den sogenannten O-Bandai, den grofsen Bandai, schlofs sich nach Nord und Nordost eine bogenförmige Reihe andrer Gipfel. Alle diese Gipfel schmolzen zusammen zu einem nach innen, nach dem Kessel zu steil abstürzenden, fast halbkreisförmigen Wall. Der O-Bandai selbst bildete gegen Osten einen fast senkrechten Absturz und verband sich dann mit einem scharfen, ostwärts ziehenden, den Kessel gegen Süden abgrenzenden Grat, der in einem stumpfen Höcker, dem Higashi-Bandai oder östlichen Bandai, auch Akahaniyama genannt seinen Abschluſs fand. Nördlich vom Akahaniyama lag der Kushigamine, ein plumper Gipfel, und zwischen diesen beiden Erhebungen öffnete sich der Kessel, die Numanotaira oder Ebene der Seen, gegen Ost, um in das Thal des nach dem Dorf Mine hinunterführenden Biwasawa auszulaufen.

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[1]) Du Pontail fand in 1000 Teilen des gelben, klaren, sehr sauer reagierenden Wassers der Kratersolfataren auf Wakari oder White Island (Neuseeland):

$Ca\,SO_4$ . . . . = 1,239
$Al_2\,(SO_4)_3$ . . . . = 0,355
$Mg\,SO_4$ . . . . = 0,189
$K_2\,SO_4$ . . . . = 0,210
$Na_2\,SO_4$ . . . . = 0,369
$Mg\,Cl_2$ . . . . = 0,066
$Fe_2\,Cl_6$ . . . . = 2,757
$P_2\,O_5$ . . . . = 0,227
$H\,Cl$ . . . . = 10,389
$Si\,O_2$ . . . . = 0,005
Spuren von Mangan und Borsäure = —
= 15,806.

„Ein so bedeutender Gehalt an freier Salzsäure“, sagt Bischoff (Lehrbuch der chem. und phys. Geologie, I. Bd.), „ist eine sehr auffallende Erscheinung. Es ist nicht anders zu denken, als dafs diese Bestandteile Produkte der Wirkungen von vulkanischen Gasexhalationen auf das Gestein sind.“

Das flache Becken unten mit dem groſsen gezackten Felsenwall sah aus wie ein in sich zusammengesunkener riesenhafter Krater, der gröſsten Achse nach gegen 2 km messend. Die Seen in der Tiefe muſsten als mit Wasser gefüllte, durch die Dämpfe einer groſsen, Solfatare gewühlte Löcher angesehen werden. Einst, ehe die Solfatare ausgebrannt war, mochte das Geheul und Gebrodel in der Tiefe, das wilde Gewühl der Dämpfe an die Hölle „O-Jigoku“, erinnern [1]), nun lag dort unten ein stiller, friedvoller Erdenfleck, dem die blitzenden oder tiefschwarzen Wasserbecken einen ganz eignen Reiz verliehen. Wer mochte bis vor 15 Jahren ahnen, daſs der so ruhig daliegende Berg sich je wieder aufthun werde?

Da erfolgt am 15. Juli 1888 um die achte Stunde des Morgens eine furchtbare Explosion. Am Kobandai, einer Erhebung, die nach den mir vorliegenden Karten am nordwestlichen Rande des Kessels liegt und den zweithöchsten nach Norden gelegenen Gipfel des Vulkans darstellt, schieſst ein ganzes Bergstück in die Luft. Das anliegende Land, besonders das Land gegen Ost, wird mit einem Regen mächtiger Blöcke und mit „Asche“, wie es in den Berichten heiſst, überschüttet.

Werfen wir, um dieses groſsartige Ereignis besser beurteilen zu können, vorerst einen Blick auf die Umgebung des Bandai. Der Vulkan liegt in unmittelbarer Nähe der groſsen Meridianspalte, welche longitudinal, mit dem ganzen Gebirge, verläuft, auf der Innenseite des Abukuma-Berglandes. Er setzt seinen westlichen Fuſs in die sich nur ca 200 m über den Meeresspiegel erhebende Ebene von Wakamats. Im Süden reicht er an das Uferland des Inawashiroko heran, eines bergumrahmten, gegen 500 m hoch gelegenen groſsen Wasserbeckens. Nach Osten und Norden verwächst er mit den Bergen. Andere groſse Vulkane, wie z. B. der Adzuma und der Osho, liegen in der Nähe. Die Aidzutaira ist auſserordentlich fruchtbar. Bäche, Flüsse und Ströme durchschneiden das von der Kultur in einen Ziergarten verwandelte, reich gesegnete Land. Da liegen am Rande Rettigfelder im frischesten lachenden Grün, weiſs blüht der Buchweizen und goldgelb prangen die Hirsefelder. In der eigentlichen Ebene deckt weithin der Bestand der erntereifen strohfarbenen Reisähren die Felder, aus waldigen Flecken lugen die Dächer von Häusern hervor, und hier und da beschattet ein ernster, stolzer, tiefgrüner Hain einen kleinen Tempel und seine Heiligtümer.

In der Nähe von Wakamats liegt das Daimio-Schloſs mit seinen groſsen Gräben, Cyklopenmauern und verfallenen Thorwegen, die jetzt von mächtigen Kiefern überwachsen sind. Dieses Schloſs war das letzte Bollwerk in den Kämpfen, die im Jahre 1868 den Fall des Shogunat's herbeiführen sollten.

Wakamats liegt 218 m über dem Meeresspiegel. Wo früher von der Stadt aus ein steiniger Weg nach Osten führte, da zieht sich jetzt seit etwa 12 Jahren eine schöne breite Straſse in vielfachen Schlangenwindungen zur Höhe. Wir gelangen nach anderthalbstündiger Wanderung auf ein breites, gewelltes, grasiges Plateau. Nicht lange dauert es nun, so stehen wir in 520 m Meereshöhe vor dem blitzenden See. Etwa 15 km dehnt sich die spiegelglatte Fläche von Nordnordwest nach Südsüdost, 10 km in der hierzu senkrechten Richtung. Das Wasserniveau liegt nur wenig — kaum 20 m — tiefer als der breite Randwall, auf dessen Höhe wir uns befinden. Hier entrollt sich ein anmutiges, entzückend schönes Landschaftsbild. Dort im Nordosten, im Norden vom See reckt O-Bandai das stolze

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[1]) Die Japaner pflegen die Schauplätze der Solfatarenthätigkeit mit dem Namen O-Jigoku (Hölle) zu bezeichnen. In der Nähe solcher Örtlichkeiten hat die Priesterschaft Tempel errichtet, da die imposanten Äuſserungen der Naturkräfte die Phantasie und den Aberglauben des Volkes auf das Mächtigste anregen.

Zackenhaupt über grauen Felsenhängen, über Klüften und Schluchten. Ein Kranz waldiger Hügel und Berge schmiegt sich an den lachenden See, wie grüne Arme des Bandai, die den silbernen Spiegel in zarter Umschlingung festhalten. Wir steigen hinab zum Ufer. An die Wasserfläche schlieſst sich hier in der Nordwestecke des Sees eine kleine sumpfige Ebene. Still und verstohlen schleichen die Wasser durch Schilf und Gras, an kleinen Theehäusern und einigen Gehöften, an knorrigen Kiefern vorbei, um der Gefangenschaft der Berge zu entgehen und gar bald in das Thal des Nippashigawa hineinzurauschen. Das Wasser des Sees ist so klar wie Kristall und so grün wie funkelnder Smaragd. Groſse Lachsforellen und andre Fische, die man vom Boot aus in ihren Bewegungen beobachten kann, gedeihen vortrefflich in dem klaren Wasser. Kleine klappernde Dampfer fahren jetzt von Ufer zu Ufer. Der See soll 150 m tief sein. Am Nordostufer zieht ein Kanal gegen die Hügel hin. Hier ist ein künstlicher Ausfluſs geschaffen, welcher dem Zwecke der Bewässerung wasserarmer Strecken des Abukuma-Thales treffliche Dienste leistet. Der Kanal führt das Wasser in einen Tunnel hinein. Wo die Hügel beginnen, setzt dieser Tunnel in etwa 2 km Entfernung vom Seeufer an. An einer Steilwand stürzt das Wasser, nachdem es die finstere Straſse geflossen, in das enge Thal des Gohyakugawa. Der See hat also jetzt einen Abfluſs nach dem Japanischen Meere und nach dem Pacifischen Ozean. Die Wasserleitung, ein ebenso interessantes wie wirtschaftlich bedeutungsvolles Werk, wurde vor 6 Jahren eröffnet.

Der Bandai ist 1840 m hoch. Er gehört also nicht zu den höchsten Bergen des Landes. Selbst in seiner Nachbarschaft gibt es Gipfel, die über 2000 m ansteigen. Aber er erscheint, weil er von fast allen Seiten frei ansteigt — denn nur im Norden verwächst er durch niedere Verbindungen mit dem eigentlichen Gebirge —, gewaltig und imposant. Der Hauptkrater des Vulkans, zu dessen Umrandung ja auch der O-Bandai gehört, wurde schon oben beschrieben. An den stark deformierten, verstürzten und verbrochenen Kegel dieses Systems, der östlich vom Nagasegawa umflossen wird, schlieſst sich westlich ein flacher und auſserordentlich stark abgestumpfter, mit groſsem, prachtvollem Krater ausgestatteter Konus. Dieser letztere Krater wird von einem See eingenommen. Während der vom O-Bandai unmittelbar überragte Kessel einen Durchmesser von kaum 2 km hat, miſst der tiefere, in etwa 1000 m Meereshöhe gelegene westliche 2,7 km. Von Westen gesehen, erscheint der Bandai doppelgipflig und wird vom Nekomagadake, wie mein Führer den stumpfen westlichen Kegel nannte, im untern Teile verdeckt. Die entschieden schönste Ansicht genieſst man von Süden aus; denn von dieser Seite markiert sich die zahnförmige Gipfelzacke am besten. Die tiefeingerissenen Schluchten ziehen wie breite, schwarze Straſsen von der Höhe zur Tiefe, und der Hauptkegel sondert sich hier deutlicher vom Nekomagadake. Ziemlich steil ist die Neigung der Gehänge, 11—17° in den untern Teilen, 17—30° oben, auf der Südseite wächst die Neigung in den höchsten Teilen des Berges bis 35°.

Kurz nach der Eruption haben sich wissenschaftliche Experten in ziemlich groſser Zahl nach dem Schauplatz der Katastrophe begeben. Unter allen entsandten Expeditionen ist indessen die von den Professoren Sekiya und Kikuchi, welche von dem Präsidenten der Tokio-Universität abgeordnet wurde, die bedeutungsvollste[1]). Die Genannten verlieſsen die Hauptstadt am 15. Juli und brachten die Zeit vom 31. Juli bis 8. Oktober auf dem Gipfel zu. In der Abhandlung, welche die Resultate der Expedition vorführt, ist für uns zunächst von Interesse, was über die Gipfelbildung des Bandai gesagt wird. Hier werden als Spitzen des Berges genannt: O-Bandai, Kobandai (bei der Eruption zerstört), Kushigamine und Akabaniyama. In ihrer Mitte liegt die Hochebene Numanotaira. Als ich mich selbst auf dem Gipfel des Bandai befand, nannte mir mein Führer alle die eben angeführten Namen mit Ausnahme des Kobandai. An Stelle des letztern wurde mir ein im Rücken der Numanotaira aufragender Berg als Yugeta bezeichnet. Bezüglich dieser Benennung besteht nun in den über den Bandai publizierten Karten keineswegs die erwünschte Klarheit. So ist bei Wada[1]) sowohl wie bei Sekiya und Kikuchi in den Kartenbeigaben der Yugetayama angeführt, bei ersterm sogar Yugeta und Kobandai. Wie ich mich seinerzeit überzeugt habe, sind am Gipfel des Bandai nicht mehr als vier Emporragungen vorhanden gewesen, und es wird bei Sekiya und Kikuchi der Yugetayama gelegentlich als Teil des Kobandai bezeichnet. Auch aus der topographischen Skizze S. 24 geht diese Auffassung hervor. In der That mufs es scheinen, als ob die beiden Namen auf einen und denselben Berg angewandt worden wären. Über die Beschaffenheit des Gipfels vor der Eruption liefern die beigegebenen Skizzen (Taf. 1 dieser Beiträge) Anhaltspunkte. Es würde interessant sein, diese Darstellungen mit korrespondierenden zu vergleichen, welche den Zustand der Gipfelregion des Bandai nach der Eruption wiedergeben. Eine Prüfung des verfügbaren Materials, besonders der zahlreichen graphischen Beilagen zu dem Berichte der Universitätsexpedition ergibt nun, dafs, wo früher vier Spitzen vorhanden waren, jetzt nur noch drei zu sehen sind. Yugeta oder Kobandai ist hinweggeblasen. Schon hierdurch gewinnen wir einen rechten Begriff von der Grofsartigkeit der Katastrophe. Mit der Behauptung, dafs der Kobandai (Yugeta) fast genau die gleiche Höhe mit dem O-Bandai gehabt habe, kann ich mich allerdings nicht einverstanden erklären. Sekiya und Kikuchi haben ihren Berechnungen eine Höhe des Kobandai zu Grunde gelegt, welche der des O-Bandai (1840 m) vollständig gleichkommt. Auf Grund meiner Skizzen und Aufzeichnungen möchte ich den Gipfel, der mir seinerzeit als Yugeta bezeichnet wurde, auf mindestens 100 m niedriger veranschlagen als den O-Bandai. Es würde also nicht ein ganzer Berg, wie man zu beweisen versucht hat, in die Luft geflogen sein, sondern nur ein halber, und die Berechnungen würden einer nicht unwesentlichen Korrektur zu unterziehen sein. Sekiya und Kikuchi geben als Gesamtvolumen der weggeblasenen Masse 1,213 cbkm an. Nimmt man mit ihnen das Areal des verwüsteten Landes zu 70 qkm, so würde auf dieser Fläche mit dem angeführten Massenbetrag eine Schicht von 17,3 m Mächtigkeit ausgebreitet werden können. Das scheint doch etwas zu viel, selbst wenn man bedenkt, dafs der berechnete Kubikinhalt des verschwundenen Bergteils auch die Staub- und Aschenmassen in sich begreift, welche weiter fortgetragen wurden. Das Gewicht des zerstörten Bergteils wird von Sekiya und Kikuchi auf 2782 Millionen Tonnen geschätzt.

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[1]) Sekiya and Kikuchi, The Eruption of Bandai-San. Transact. Seismol. Soc. of Japan. Read, Oct. 11th 1888.

Von Interesse sind die von Sekiya und Kikuchi mitgetheilten Erlebnisse eines Augenzeugen. Tsurumaki, ein Priester aus Echigo, befand sich zur Zeit des Ausbruchs in den Bädern von Nakanoyu. Er ist dem Tode wie durch ein Wunder entgangen und hat folgenden Bericht über seine Erlebnisse geliefert: „Am 8. Juli brach ich in Gesellschaft von vier Freunden aus meinem Heimatsdorfe auf, um mich nach dem Bandai zu begeben, wo ich am 12., also drei Tage vor der Katastrophe, anlangte. Ich war schon früher, im Juli 1885, auf dem Berge gewesen. Jetzt erschien mir der Nebel ungewöhnlich dicht, auch kam es mir vor, als ob zu Kaminoyu weniger Dampf ausgestofsen würde. Am 13. war der Nebel noch dicker und blieb so bis zum Abend. Der 14. war schön und klar. Ungefähr von 10 Uhr morgens an verminderte sich der Ausflufs der Quelle. Wir schenkten jedoch diesem Umstande keine weitere Beachtung, da wir wufsten, dafs der Ausflufs bei schönem Wetter ab- und bei bewölktem Himmel zunähme. Der Morgen des 15., des Unglückstags, brach an mit klarem, schönem Himmel. Die Quelle flofs wie gewöhnlich. Da ereignete sich ungefähr um 8 Uhr eine fürchterliche Zuckung des Bodens, so dafs wir alle aus den Häusern stürzten. Nach ungefähr 10 Minuten (Sekunden?), während wir uns angstvoll fragten, was da vorging, brach an der Flanke des Kobandai etwa 100 m über einer Stelle, an welcher sich seit undenklichen Zeiten Dampfmassen zutage gearbeitet hatten, eine furchtbare Explosion los. Darauf folgte eine dichte Masse schwarzen Rauches, die sich schnell erhob, um den Himmel zu bedecken. Zu gleicher Zeit fielen rings um uns ganze Schauer groſser und kleiner Steine nieder, Donnerschläge vermehrten den Schrecken, und die Zerstörung der Berge und Wälder bot einen so schrecklichen Anblick, daſs ich ihn nicht vergessen werde so lange ich lebe. Wir flohen in allen Richtungen, waren aber kaum wenige Schritte weit gekommen, als wir alle der Länge nach zu Boden geworfen wurden. Es war pechschwarz um uns her, die Erde bebte unter uns, Mund, Nase, Augen und Ohren waren mit Schlamm und Asche verstopft. Wir vermochten weder zu schreien, noch uns zu bewegen. Kaum wuſste ich, ob ich tot war oder träumte. Da fiel ein Stein auf meine Hand und ich merkte, daſs ich verwundet war. Überzeugt, vor dem Tode zu stehen, betete ich zu Buddha. Später erhielt ich noch Wunden an der Lende, am Fuſs und auf dem Rücken. Nach Verlauf einer Stunde hörte der Steinregen auf, und an Stelle der Nacht war ein mondscheinähnliches Licht getreten. Ich glaubte nun, die Gelegenheit zur Flucht sei gekommen, stand auf und schrie: ‚Freunde, folgt mir!‘ Aber niemand gab mir Antwort. Nachdem ich etwa 220 m bergab gestiegen war, erfolgte eine zweite und nach weitern 100 m eine dritte Explosion. Hierbei wurden Sand und Asche ausgeworfen, keine Steine. Um Mittag langte ich in Odera an, wo meine Wunden Pflege fanden.“

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[1]) Wada, T., Direktor der geol. Reichsanstalt, Der Ausbruch des Bandai-San im Juli 1888. Mitt. der deutschen Gesellsch. f. Natur- u. Völkerk. Ostasiens, Bd. V, Heft 42. Juli 1889.

Die kolossalen Trümmermassen, welche von dem Berge ausgeworfen wurden, um sich dann stellenweise in Form von Strömen der Tiefe zuzuwälzen, müssen sich überall dort, wo sie noch nicht das Gleichgewicht erlangt hatten, wie flieſsendes Wasser verhalten haben. Die Schlamm- und Sandströme hinterlieſsen an den Thalrändern deutliche Spuren ihres Wogenganges, und die Beobachtungen beweisen, daſs sie an Hindernissen, die sich ihnen in den Weg stellten, hoch aufbrandeten. Mit furchtbarer Geschwindigkeit erfolgte das Abflieſsen durch die Thäler. Sekiya und Kikuchi schätzen die Bewegung auf 77 km per Stunde. In einem Falle — bei Karakami, wo sich ein Hügel dem Trümmerstrome entgegenstellte — schwoll dieser zu nicht weniger als 40 m an. An einer andern Stelle brandete die Masse, wo sich ihr ein Hügelausläufer entgegenstellte, 30—60 m hoch.

Der gröſsere Teil des ausgeworfenen Materials befand sich in trocknem Zustande. Eine Durchfeuchtung hatte allerdings durch den verdichteten Dampf stattgefunden.

Die vollständige Verdunkelung der Atmosphäre hielt nur eine Stunde an. Der „Aschenregen“ hörte erst 8 Stunden nach der Explosion auf. Staub fiel bis zum Pazifischen Ozean in 100 km Entfernung von der Ausbruchsstelle. Die staubüberstreute Fläche gleicht der Form nach einem halbgeöffneten Fächer und ist der westnordwestlichen Windrichtung entsprechend ostwärts gerichtet. Die Windstöſse, welche mit der Explosion im Zusammenhang standen, müssen furchtbar gewesen sein. J. Wada schätzt ihre Geschwindigkeit auf nicht weniger als 40 m per Sekunde. Merkwürdigerweise hielten sich die verheerenden Wirkungen der aufgeregten Atmosphäre an auſserordentlich scharf ausgeprägte Grenzen. Wurden ganze Wälder niedergerissen, so blieben solche Bäume vollständig verschont, welche sich nur in einer Entfernung von wenigen Metern von den Stellen befunden hatten, in denen die Wirkungen am furchtbarsten aufgetreten waren.

Sehr groſse Meinungsverschiedenheiten sind bezüglich der kegelförmigen Vertiefungen aufgetaucht, welche sich zu Tausenden in der Nachbarschaft des Kraters sowohl wie auf den Abhängen des O-Bandai und Akahani finden. Die Gröſse dieser Löcher schwankt zwischen 0,2—3,0 m im Durchmesser und von wenigen Dezimetern bis über 1 m in der Tiefe. Es ist die Ansicht aufgestellt worden, daſs diese Vertiefungen nichts andres sein könnten als Miniaturkrater, durch Explosionen entstanden. Man hat ihnen eine seismische Entstehung zuschreiben wollen. Andre wieder, vor allem Sekiya und Kikuchi, sowie Odlum, halten die Löcher für die Spuren niedergefallener Auswürflinge, und diese Auffassung ist jedenfalls die richtige. Sind doch Steine am Grunde der Löcher nachgewiesen worden.

Das durch den Ausbruch hervorgerufene Schallphänomen scheint sich über 160 km weit erstreckt zu haben. Der Durchmesser des Schüttergebietes beträgt 100 km. Was die Zerstörungen anbetrifft, so beträgt das verschüttete Areal nach Wada:

Bebautes Land	83 ha,
Waldungen	4228 „
Unbebautes Land . . .	2279 „
Felsiger Boden	540 „
zusammen	7130 ha.

Mit Ausschluſs der infolge von Verletzungen Umgekommenen fanden 461 Menschen unter den Auswurfstrümmern ihren Tod.

C. G. Knott und C. Smith haben dem Schauplatz des Bandai-Ausbruchs Ende Mai 1889 einen Besuch abgestattet. Nach ihren Berichten sind seit dem Ausbruch groſse bemerkenswerte Veränderungen in der Beschaffenheit des den Vulkan umgebenden Landes eingetreten. Die durch Abdämmung entstandenen Seen von Hibara und Osuzawa hatten sich zu einem riesigen See vereinigt. Von besonderm Interesse sind nun die Beobachtungen, welche die Genannten über Erosion anstellen konnten. Der kleine, das Biwasawa-Thal herunterströmende Wasserlauf hatte in der Thalfüllung bereits eine V förmige Furche ausgewühlt. An manchen Stellen lieſs diese Furche die auſserordentliche Tiefe von 40—60 m erkennen.

Es erübrigt, der Resultate zu gedenken, welche die japanischen Beobachter bezüglich der chemischen Natur der Gesteine und des Kraterwassers erzielt haben. T. Wada [1]) liefert einige hochinteressante Mitteilungen über Gesteinsumwandlungen, welche durch die aufdringenden Dämpfe hervorgerufen worden sind. Der braunrote oder graue Augitandesit des Bandai geht in ein schneeweiſses, poröses Umwandlungsprodukt über, welches durch einen auffallend hohen Gehalt an Kieselsäure (91,66 $^0/_0$) ausgezeichnet ist. Wada vergleicht dieses Zersetzungsprodukt mit dem Porzellanstein von Arita. Schon v. Richthofen hat die für die japanische Porzellanindustrie so bedeutungsvollen weiſsen Aritasteine als Resultate der Einwirkung von Solfatarendämpfen auf vulkanische Gesteine angesehen.

Das Kraterwasser enthält sehr viel $Ca\,SO_4$ (1,13658 pro mille, $Si\,O_2$ 0,17858, $Na\,Cl$ 0,15407 pro mille). Ganz verschieden hiervon zeigt sich, wie sich der freundliche Leser erinnern wird, die Zusammensetzung des Shirane-Kraterwassers.

Der durch die Katastrophe vom 15. Juli 1888 erzeugte Eruptionskrater ist von Hufeisenform. Er kehrt seine offne Seite nach Nordwestnord. Eine schroffe Felswand, welche sich im Süden etwa 500 m über die 1170 m hohe Sohle des Explosionskraters erhebt, stellt die groſse Ruine des Yugeta vor. Der Steilabbruch umzieht die ganze Kratertiefe, die offne Nordseite natürlich ausgenommen. Der gröſste Durchmesser des neugebildeten Kraters beträgt 2234 m. Eine mächtige klaffende Spalte zieht sich durch die westliche Hälfte des Kraters von der Senke zwischen Kushigamine und der Yugeta-Ruine ausgehend nach Nordwest. Nach der von Wada mitgeteilten Karte beträgt der Durchmesser des alten, des sogenannten Numanotaira-Kraters etwas über 1 km. Dagegen erscheinen die Dimensionen des dem Bandai anhängenden Nekomatake-Kraters ganz bedeutend. Derselbe miſst 2,2 km im Durchmesser und ist dabei so ziemlich kreisrund. Während der letztgenannte seine Entstehung unzweifelhaft echt vulkanischen Ausbrüchen zu verdanken hat, müssen die Numanotaira-Gebilde ähnlichen Vorgängen zugeschrieben werden, wie die, welche jüngst stattgefunden haben. Denn auch hier am Rande des Numanotaira-Kessels finden sich hoch aufragende Felswände und Steilabbrüche. Aus der Tiefe schauen zahlreiche Lachen und Seen herauf, die Spuren einstmaliger Solfatarenthätigkeit, die letzte Folge einer Explosion.

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[1]) T. Wada, Der Ausbruch des Bandaisan im Juli 1888.

3. Schlussbetrachtungen.

Wenn wir jetzt die Dampfausbrüche des Shirane und des Bandai noch einmal überblicken, so zeigen beide Vorgänge eine höchst merkwürdige Analogie. In beiden Fällen haben wir es mit Vulkanen zu thun, die allem Anschein nach ausgebrannt sind; in beiden Fällen fand im Krater des Vulkans urplötzlich eine gewaltige, durch unterirdische Dampfansammlungen hervorgerufene Explosion statt. Die Bandai-Katastrophe war freilich viel grofsartiger als das Ereignis am Shirane. Bei letzterm war auch kein Verlust an Menschenleben zu beklagen, und ebensowenig hatte die Explosion in Wald und Feld nennenswerten Schaden angerichtet. Stand doch selbst das am Fufse des obern Kegels errichtete, in so grofser Nähe des Explosionsherdes befindliche Theehaus noch vollständig unversehrt! In den Berichten über den Shirane-Ausbruch sowohl wie über die Bandai-Eruption war anfangs von Aschenregen die Rede. Was den Shirane betrifft, so waren die Beschreibungen der Vorgänge überhaupt so gefärbt, dafs man sehr wohl annehmen konnte, es hätte ein Lavaergufs stattgefunden, wenigstens ein normaler Vulkanausbruch. Es kamen Mitteilungen über einen Feuerschein, den man von Ikao aus gesehen haben wollte. Als ich dann am Shirane anlangte, war ich angesichts der Verhältnisse, die ich fand, nicht wenig enttäuscht; denn ich hatte erwartet, feuerflüssige Lava zu sehen, und nun bot sich dem Blicke nichts als Dampf, Schlamm und Felsentrümmer.

Die beiden Explosionen haben bedeutungsvolle Abänderungen der Oberflächengestaltung, wichtige Modifikationen der Bergformen hervorgerufen. Am Gipfel des Shirane finden wir jetzt an Stelle des flachen Kratersees einen Minentrichter, einen Explosionskrater, ein Maar. Ich darf bei dieser Gelegenheit auf die merkwürdigen, meist kesselförmigen Schachtöffnungen der Eifel hinweisen, jene im Schiefer oder Sandstein ganz unvermittelt auftretenden, mit Steilwänden versehenen Löcher von gröfsern oder geringern Dimensionen. Über die Entstehung der Eifelmaare hat man sich schon viel den Kopf zerbrochen. Behaupten die einen, dafs man es hier mit Formerscheinungen zu thun habe, welche durch Einstürze in unterirdische Hohlräume erzeugt wurden, so wollen die andern die Entstehung durch Explosion beweisen. Nach der einen Theorie wäre also die Masse, welche einst den Raum füllte, der jetzt entweder leer oder mit Wasser gefüllt ist, einfach der Schwere folgend nach unten gesunken, nach der andern wäre sie nach oben getrieben worden. Der Shirane-Schlot liefert einen prächtigen Beweis für die Stichhaltigkeit der letztern Annahme. Wir lernen, dafs die Maare wenigstens in einer Anzahl von Fällen durch Explosion entstanden sein müssen, wir lernen ferner, dafs ein Maar in einem Vulkankrater entstehen kann und dafs derselbe Vorgang, welcher ein Maar erzeugt, auch die Bildung grofser Spalten, wie am Gipfel des Bandai, bedingen kann.

Zum Schlufs möchte ich nun noch einmal hinweisen auf die schön geschichteten Ablagerungen, welche im Schofse des Shirane-Kraters nachgewiesen werden konnten. Solche Bildungen sind nicht zum mindesten deshalb von Interesse, weil bisher, meines Wissens wenigstens, kein ähnliches Beispiel bekannt geworden ist. In einem durchaus jugendlichen Vulkankrater am Gipfel eines echten Lavaberges würde man wohl schön geschichtete Schlamm-Ablagerungen, unter Mitwirkung der vulkanischen Thätigkeit entstanden, zuletzt erwartet haben.

II.

Die Fossa magna.

1. Reisen in die Fossa magna.

Am 17. August 1875 war ich in Japan angekommen; am 4. November unternahm ich meinen ersten Ausflug ins Innere. Bei Durchmusterung der auf dieser Reise gesammelten Notizen muſs ich bekennen, daſs ich damals noch ein rechter Neuling war. Aber die Eindrücke haben in jener Zeit so mächtig auf mich gewirkt, daſs sie sich fest mit mir verbunden haben und daſs sie mir jetzt in voller Frische, mit allen Einzelheiten wieder vor Augen treten. Früh 5 Uhr 20 Minuten verlieſsen wir in einem jener elenden Pferdegespanne, welche damals eben angefangen hatten, den Djinrikishas[1]) auf den groſsen Landstraſsen ernstlich Konkurrenz zu machen, die Hauptstadt und fuhren auf dem Nakasendo in den frischen, tauigen Morgen hinein. Das Sonnenlicht glänzte auf Wald, Busch und Feld, auf Häusern und Hecken. Auch über die erbärmlichsten, vom Alter grauen, morschen Holzhütten floſs das Gold und täuschte selbst über Armut und Elend hinweg. Ein fröhliches Gesicht und ein freundlicher Gruſs fehlte bei keinem der uns entgegenziehenden Landleute, Pferdetreiber und Wanderer. Das saubere Städtchen Urawa hatte den bunten Flaggen- und Laternenschmuck, den es zwei Tage vorher am Geburtstage des Kaisers angelegt, noch nicht abgestreift. In Kumagaye, wo wir mittags 1 Uhr anlangten, merkte man weniger von der kaum verklungenen Festfreude, um so mehr aber von Handel und Verkehr. Die Straſsen waren gefüllt mit Packpferden, Ninsokus, Kaufleuten und Reisenden. Abends 7 Uhr erfolgte die Ankunft in Takasaki, woselbst uns ein wenig erfreulicher Empfang zu teil wurde — eine ziemlich niederschlagende Erfahrung nach dem schönen Tage. In den Theehäusern, wo wir uns auch vorstellen mochten, war angeblich kein Platz. Die mürrischen Mienen der Wirte zeigten, daſs man von den Fremden nichts wissen wollte. Nach langem Hin- und Herziehen muſste ich mich an die Ortsbehörde wenden, und endlich gelang es dem Bürgermeister, nachdem er so etwa eine Stunde herumgelaufen war, uns, die wir lange genug müde und hungrig gewartet hatten, ein im hintern Teile eines Gehöftes über dem Magazin gelegenes, recht ungastlich aussehendes Gemach zu verschaffen. Dafür ging es nun am andern Morgen unter der freundlich leuchtenden Sonne westwärts dem Gebirge zu. Nordöstlich lag der breite, flache Vulkanriese Akagi, nordwestlich der zackengipflige, gleichfalls durch Feuerskraft entstandene Bergstock Haruna, westwärts am Grunde der zipfelförmigen Bucht, welche die Ebene in das Gebirge hineinschiebt, der vielzackige, merkwürdige Rücken des Miogi, und linker Hand nach Süden und Südwesten ruhten hinter hügeligen Geländen aus Tuff die breiten ineinandergewachsenen Massen des alten Berglandes von Kuanto mit ihren sanft geschwungenen Konturen. Jetzt führt eine Eisenbahn bis Yokogawa. Sie kreuzt auf einer hohen Brücke aus Eisen bei Matsuida das tief eingeschnittene Thal des

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[1]) Die Djinrikishas, zweiräderige von Menschen gezogene Karren, haben sich von Japan aus über sämtliche Küstenplätze Ostasiens verbreitet. Man sieht sie jetzt in Hongkong, Saigong, Singapore &c.

Usuigawa. Früher überstieg man den Bergwall im Usuitoge, einem 1200 m hohen Paſs. Jetzt tritt man an einer Stelle, welche 3 km südlich vom alten Passe liegt und nur 966 m hoch ist, durch eine Scharte in der wallförmigen Umgrenzung der Hochebene in die letztere ein und befindet sich sofort am Anfangspunkte der Eisenbahn, welche nach der Westküste führt, über Ueda und Nagano nach Takata. Die Dampfverbindung zwischen Takata und Tokio weist also im Usuitoge immer noch eine durch Trambahnverbindung allerdings einigermaſsen ausgeglichene Unterbrechung auf. Diese Lücke von 9 km Länge in gerader Entfernung wird wohl nicht so bald überwunden werden. Sie entspricht einer Höhendifferenz von nahezu 600 m [1]).

In Oiwake, dem Rastplatz der alten Daimio- (Fürsten-) Züge, welcher noch zur Zeit meiner ersten Reise wenig von den rauschenden Lustbarkeiten und gewissermaſsen auch von dem Glanze der alten Zeit eingebüſst hatte, quartierten wir uns für einige Tage ein, und ich unternahm eine Besteigung des direkt nördlich vom Dorfe aufwachsenden Asamayama. Dann wandten wir uns von Oiwake aus südwärts, um das Thal des Chikumagawa hinaufzuziehen. Auf der linken Seite der Straſse werden die felsigen, zackenrückigen und vielgipfeligen Decken und Gänge aus Vulkangestein bald abgelöst von den Wällen des alten Berglandes. Sobald wir an das letztere herangetreten waren, hatte sich auch das Thal verengt, und der Weg führte am Fuſse einer rechter Hand hoch aufsteigenden, mächtigen, nicht weniger als 20 km langen Kette vulkanischer Gipfel hin, der Kette des Tateshina (2530 m) und Yatsugatake (2982 m). Uminokuchi ist 36 km südlich von Oiwake gelegen, 1072 m hoch. Nachdem man erstgenannten Ort und mit ihm das Thal verlassen hat, kommt man auf eine Hara, die sich ins Endlose zu dehnen scheint. Ich langte mit meinem Dolmetsch gerade bei einbrechender Dunkelheit hier oben an. Es war am 12. November. Erst am Ende dieser weiten, vollständig unbebauten Einöde stieſsen wir nach mehrstündiger Wanderung auf einige dürftige Häuser. Hinter den Häusern erhob sich in einiger Entfernung das Terrain wieder zu einem ziemlich scharfen Gebirgsrücken, über den wir noch hinweg muſsten. Als wir oben auf dem ca 1300 m hohen Paſs angelangt waren, brach gerade der Vollmond durch die tief herabhängenden, schweren Wolkenschleier und goſs sein silbernes Licht über die Landschaft. Rechts traten aus den Wolken hervor die Zacken des Yatsugatakastockes, der sich mondbeglänzt mit seinen schneegefüllten Schluchten, von dicht geballten Dampfmassen getragen gar wundersam ausnahm. Links eine Felswand des Passes, darunter das tiefe Thal mit seinen schwarzen Schatten. Wir standen über einer unabsehbaren Flut von Wolken. Dabei jagte der Sturm mit wildem Gebrause über die Bergeshöhen. Stumm, überwältigt von den groſsartigen Eindrücken, stiegen wir hinunter nach Hirasawa, einem elenden Dorfe, das noch in 1123 m Höhe liegt. Die verwahrlosten Hütten sahen wenig einladend aus, und es war trotz groſser Ermüdung nicht gerade erfreulich, zu erfahren, daſs wir unser Reiseziel vor Augen hatten. Unsre Ankunft erweckte einiges Aufsehen. Der Lärm lockte sofort meinen schon bei Sonnenuntergang angekommenen Diener aus einem elenden Hause hervor, das auch uns, den neuen Ankömmlingen, als Obdach dienen sollte. Ich zwängte mich durch die enge Eingangsöffnung hindurch und richtete mich zwischen vier schmutzigen Wänden so gut wie möglich ein. Der orkanartige Sturm rüttelte gewaltig an dem lockern Gebäude. Das gastlichste Dach des Dorfes hatte übrigens alle Ursache, stolz zu sein, denn es durfte sich von früher her hoher Gäste rühmen. Eine Inschrift an der Wand erinnerte an einen fürstlichen Herrn, der hier einmal Unterkunft gefunden. Kaum hatte ich mich schlafen gelegt und mit Hilfe ganzer Barrikaden von Kissen gegen den auf den

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[1]) Lange ehe die Bahn bis zum Fuſse des Usuitoge projektiert wurde, habe ich der Regierung vorgeschlagen, den Aufstieg zum Hochland von Shinshiu über den Wamitoge, einen südlich vom Usuitoge gelegenen Paſs, zu bewerkstelligen. Auf dieser südlichen Linie wären viel weniger Schwierigkeiten zu überwinden gewesen. Allein die betreffenden Berichte und Aufnahmen sind wohl nie in die Hände der Ingenieure gelangt. Jedenfalls sind sie in Vergessenheit geraten.

Wegen zahlloser Luken und Ritzen einbrechenden, durch das Zimmer pfeifenden Wind eine Schutzwehr herzustellen gesucht, so erhob sich rings um mich ein fürchterliches Getöse. Der Sturm hatte die Bretterumwandung des Hauses eingedrückt, stürzte mit voller Gewalt ins Innere, wirbelte Papierthüren und die verschiedensten Gegenstände der Hauseinrichtung durcheinander und liefs uns die ganze Nacht keine Ruhe.

Als der Morgen anbrach, sah ich mit Staunen, dafs sich das Bild der Oberfläche während der nächtlichen Wanderung von gestern vollständig geändert hatte. Fast war mir zu Mute, als ob ich mich in einer ganz neuen Welt befände. Ich stand am Rande einer breiten Einsenkung. Drüben wuchsen Bergriesen in dichtem Gedränge auf, Berge von 3000 m und darüber. In scharf ausgeprägter, gerader Linie setzten die steilen Hänge auf der andern Seite ihren Fufs an die Senke, und es war kein Zweifel, am Saume der Berge mufste ein Flufs aus Nordwesten nach Südosten ziehen. Linker Hand schob das Bergland, aus dem ich herausgetreten, noch Ausläufer und Riegel gegen die Senke vor. Nach Südsüdwesten stieg der gewaltige Fuji zum Himmel auf. Wohl wurde mir damals klar, dafs ich einer in hohem Grade auffallenden Oberflächenbildung gegenüberstand, aber ich konnte noch nicht ahnen, was es mit der quer über den ganzen Inselbogen verlaufenden Furche, deren Schofs zahlreiche Vulkane entstiegen, unter ihnen der gröfste des Landes, für eine Bewandtnis habe, auf welche gebirgsbildende Vorgänge die langgestreckte, transversal gestellte, durch vulkanische Schmarotzer ausgezeichnete Depression zurückzuführen sei. Im Laufe meiner Aufnahmen hat sich der Schleier, welcher damals noch über den grundlegenden Vorgängen ausgebreitet war, allmählich gehoben. Ich habe den grofsen Graben, der mich schon bei meiner ersten Reise in Erstaunen setzte, als die sich in der Form der Oberfläche deutlich ausprägende Spur einer grofsen Querspalte deuten können und für ihn, weil er einen besondern Namen verdient, mit Rücksicht auf die Oberflächengestaltung und in dem Bestreben, einen Namen aufzustellen, der Aussicht auf internationale Anwendung hat, die Bezeichnung **Fossa magna** vorgeschlagen. Kein andres Gebirge der ganzen Erde hat eine Erscheinung aufzuweisen, die sich mit der Fossa magna vergleichen könnte. Ihre Verhältnisse sind für die Entstehungsgeschichte des Japanischen Gebirges wie für die Wissenschaft der Gebirgsbildung überhaupt von allergröfster Bedeutung. Ehe wir die geologischen Verhältnisse einer Betrachtung unterziehen, wollen wir der grabenförmigen Senke des Terrains noch von einer andern Seite nahetreten, und es möge mir so gestattet sein, vorerst die auf einigen andern Streifzügen durch das Land gesammelten Erfahrungen darzulegen.

Wir kehren nach Oiwake zurück und ziehen von hier aus ein Stück dieselbe Strafse, die uns nach Hirasawa führte, 20 km weit bis nach Takano. Der Weg zieht zuerst auf dem flachen, kahlen, nur spärlich mit Gras bewachsenen Abhang des Vulkans hin. Blöcke und Bomben sind über den Hang zerstreut. Der Untergrund besteht überall aus vulkanischem Tuff. Längs der Flüsse ziehen prächtige Terrassenwände hin. Vor Takano stehen paläozoische Hornsteine an. Dicht bei Takano stofsen wir am linken Ufer des Flusses auf bedeutende Massen vulkanischer Breccien. Dieses Gestein ist im Thal vielorts zu finden und gehört den Lavaergüssen der Tateshina—Yatsugatake-Kette zu. Auch grofse Massen vulkanischen Tuffs treten dicht bei Takano auf. Am 18. Juli 1876 sollte der grofse Vulkanstock des Tateshina überschritten werden. Der Weg führt erst im Hauptthal fort, ungefähr 4 km weit in südlicher Richtung, dann biegt er südwestwärts ab und läuft im Seitenthale aufwärts. In diesem Thale, das sich in einer Entfernung von 3 km vom Hauptthale gabelt, ragen beiderseits Felsen der vulkanischen Breccie hervor. Dann folgt aber bald Andesit. Im Dorfe Yakorimura wurden die Pferde gewechselt. Die Kaisha, das konzessionierte Speditionsinstitut, hatte uns nur bis zu diesem Punkte verholfen, und ich war am vorhergehenden Abend genötigt gewesen, einen Mann hierher zu schicken, der die Pferde und Leute bei den Bauern bestellen sollte. Der Dorfschulze von Yakorimura zeigte sich schon am Eingang des Ortes, empfing uns in ehrerbietiger Weise, und ihm folgend gelangten wir an das nicht übel aussehende Theehaus. Nach halbstündigem Aufenthalt ging es weiter. Viel vulkanische Breccie lag am Wege, auch Obsidiane traten auf, Andesit in grofsen Massen. Breccien und Andesit setzten das ganze Gebirge zusammen. Waren die tiefer liegenden Hänge nur spärlich bewachsen, so führte der Weg weiter oben durch prächtige Tannenwaldungen über das Wurzelwerk der Bäume. Blöcke und Brocken lagen in grofser Zahl umher. Wir befanden uns bereits im Sattel zwischen zwei Bergspitzen. Der Wald war feucht und der Weg nafs. Faulende Baumstämme waren über den Pfad gestürzt und lagen im dichten Gehölz eines japanischen Urwaldes, dem die Axt noch nichts angethan hatte. Plötzlich hob sich das Dunkel über dem Wurzelpfade, das ungeschwächte Tageslicht strahlte uns entgegen und wir befanden uns auf freier, freundlich grüner Halde, die, vom Dunkelgrün des Waldes umrahmt, zur Rast einlud. Das war die Höhe des Passes, nahezu 2000 m über dem Meeresspiegel. Hier lagerten schon Pferdetreiber. Die ihrer Hut anvertrauten Tiere grasten, sich selbst überlassen, die schwere Bürde auf dem Rücken kaum beachtend. Zu meiner Truppe gehörten 9 Mann (3 Pferdetreiber, ein Führer, mein Diener und 4 Schüler). Freudige Zurufe wurden gewechselt, und auch wir lagerten uns auf der waldumkränzten Matte.

Ein kleines Stück weiter und wir stehen auf einem freien Aussichtspunkt. Zu unsern Füfsen liegt ein weiter, von hohen Ketten umschlossener Kessel, ein Teil der Fossa magna. Die tiefste Einsenkung des Terrains, welche direkt vor uns, aber ziemlich weit weg liegt, füllt der See von Suwa. Etwas verworrengestaltig ragen die Bergrücken weit im Hintergrunde empor. Die von Nordwest nach Südost ziehende Flufslinie auf der andern Seite der Einsenkung ist auch hier scharf ausgeprägt.

Der Abstieg auf der Westseite ist dem Aufstieg auf der Ostseite so ziemlich gleich. Der Spiegel des Suwa-Ko und Takano liegen beinahe in gleicher Höhe. Ersterer ist sogar 60 m höher gelegen als das Dorf, das den Ausgangspunkt unsers Pafsübergangs bildete. Auf dem Wege zur Tiefe steht ausschliefslich Trachyt an. Unser Führer zeigte eine auf sehr schwachen Füfsen stehende Ortskenntnis, und wir mufsten mehrfach auf das Gepäck warten, um einen besser Bescheid wissenden Pferdetreiber zu Rate zu ziehen. Nach so manchem Ungemach kamen wir schliefslich in Takinoyu, einem südlich vom Tateshinagipfel gelegenen Badeort, an. Das Bad liegt im Thalrisse und besteht aus zwölf sehr kümmerlich beschaffenen Häusern. Am obern Ende der Ortschaft steht eine Reismühle am Bache, unten schliefst das Dorf mit einer Brücke und einem Vorratshause ab. Am obern Ende der Ortschaft befindet sich das Häuslein mit den für sämtliche Gäste berechneten Fremdenzimmern. Das Volk der Ratten war empört über die Eindringlinge und raste in wilder Jagd in den Wandschränken herum. Später kamen andre Plagegeister: Flöhe und Mosquitos.

Die Quellen von Takinoyu verdienen eigentlich ihren Ruf, als heifse Quellen heilkräftig zu wirken, nicht. Sie sind offenbar noch vor kurzem durch eine höhere Temperatur ausgezeichnet gewesen, aber zur Zeit meines Besuchs waren sie so gut wie ganz erkaltet. In der Nähe liegen übrigens noch verschiedene andre Quellen, die warm sein sollen. Auf der andern Seite des Tateshina-Zuges befindet sich Motoyu, eine heifse Schwefelquelle. Unterhalb Takinoyu geniefst man einen guten Blick auf die Yatsugatakekette, auf das Achtgipfelgebirge. Mein Führer nannte mir, ohne einen Augenblick zu stocken, die Namen der acht Gipfel, belog mich aber dabei, wie sich bald herausstellte, auf das schändlichste. Er hatte keine Ahnung von den Namen der Berge und wies auch sonst keine hervorragenden Eigenschaften auf, ausgenommen die, dafs er nie in Verlegenheit geriet, wenn er nach etwas gefragt wurde. Nach einer japanischen Geographie sind die Namen der acht Gipfel von Süden nach Norden: Akatake oder rote Spitze, Nakatake oder Mittelspitze, Amida, Jizo, Kokuso, Mikabori, Yokatake, Iwo. Der Tateshina gehört nicht zum Achtgipfelgebirge, er bildet einen besondern Kegel. Auf der Karte der geologischen Aufnahme sind im Yatsugatakestocke fünf Gipfel aufgeführt, nämlich Amigasatake, Gogentake, Nishitake, Amidatake und Akagatake. Atkinson, der den Yatsugatake im Jahre 1879 bestiegen hat, gibt Mikaboriyama, Jizo und Akatake als Namen der Gipfel an. Dieses Beispiel zeigt, welchen Schwierigkeiten es unterliegt, die Bergnamen Japans festzustellen.

Vor dem Suwa-See liegt ein Bergriegel aus Granit, der sich bis zu 200 m Höhe über das umgebende Land erhebt. Zwischen diesem Granitriegel und dem gegenüberliegenden Rande der Fossa ziehen die Gewässer durch eine Art Bergthor dem See zu. Hier verrät schon ein Block von Gneiſs das Auftreten kristallinischer Schiefer. In der freundlichen Stadt Takashima oder Kami no Suwa fanden wir ein gutes Unterkommen. Das in der Nähe des Sees gelegene Theehaus besteht aus zwei geräumigen Bauten, die durch einen hübschen Garten voneinander getrennt werden. Über dem Garten führt eine Brücke aus dem einen Haus in das andre, und unter der Brücke befindet sich das durch heiſse, den Bergen bei Takashima entspringende Wasser gespeiste Bad. Die heiſsen Quellen liegen gleich nördlich von der Stadt am Fuſse der Berge, zu Yunowaki. Aber auch am Nordwestende des Sees zu Shimo no Suwa ist eine heiſse Quelle, Yunowaki, gelegen.

Am folgenden Morgen holte uns ein mit Matten beladener Schiffer vom Theehause ab. Er führte uns nach einem Kanal. Dort stiegen wir in eine zierliche Gondel, und es ging dem See zu, an dem alten, westlich von der Stadt dicht am Wasser gelegenen Schloſs vorbei. Während unsre heimischen Schloſsbauten mit vielen Türmen und Zinnen hoch in die Lüfte ragen, dehnen sich die japanischen mehr in der Breite aus. Auch das Schloſs von Kami no Suwa hat seine breiten und tiefen Festungsgräben, seine Cyklopenmauern und an den Ecken der Festungsanlage seine gedrungenen, aus mehreren Stockwerken bestehenden Turmbauten. Der See hat fast durchgängig flache Ufer. Seine gröſste Tiefe soll nur 30 Fuſs betragen. Nach einem erfrischenden Bade brachte uns das Boot ans Land, und wir kamen nach kurzer Wanderung in Shimo no Suwa an. Nach diesem Dorfe folgt bald ein Paſs von 1060 m Meereshöhe, der Shiojiritage. Die Berge bestehen aus Andesit. Die Höhe bietet einen herrlichen Blick auf das vorliegende Terrain. Ein Zug steigt hinter dem andern an, immer neue wachsen auf, bis in weiter Ferne die Riesen der Hidakette in Wolken gehüllt das Ganze abschlieſsen. Unten liegt eine Ebene, fernab durch einen N—S streichenden Bergzug begrenzt.

In der weiten, von einigen kurzen und niedern Rücken durchsetzten Fläche liegt Matsumoto, die Hauptstadt der Provinz Shinano. Von hier aus geht es weiter nach Nordwest, nach Omachi und von Omachi aus dann links in die Berge hinein, in die Gebirgswildnis des Tateyama und der andern benachbarten Riesen der Hidakette der Küste zu. Bei Omachi sind wir aus der Fossa magna herausgetreten.

Es erübrigt, meiner dritten gröſsern Reise in die Fossa magna, die ich im Jahre 1883 ausführte, zu gedenken. Ich verlieſs Tokio am 22. Juli und übernachtete am Rande der Ebene in dem wohlhabenden Städtchen Hachuochi, westlich von der Hauptstadt und in 36 km Entfernung davon. Hinter der Stadt geht es noch ein Stück durch ebenes Land. Die Berge rücken näher und näher. Bei Kamikunogita tritt man ins Thal. Die Straſse führt hier zwischen zwei Reihen hölzerner Hütten durch. Rechts und links erheben sich die kegelförmig gegliederten, mit Gebüsch und Mischwald überzogenen Ausläufer des Berglandes. In dieser Gegend wird viel Seidenzucht getrieben. Überhaupt scheint es, als ob in der ganzen Ebene von Tokio die Maulbeerbäume am Rande des Flachlands am besten gediehen. Bald verraten Schiefer und Grauwacken, daſs es paläozoische Gebilde sind, welche die vorliegenden Höhen und die ringsum auftauchenden Hügel zusammensetzen. Wir betreten auf steilem Pfad einen Damm des Gebirges, einen Ausläufer des alten Berglands von Kuanto, der hier sich allmählich verflachend südwärts zieht. Der Paſs Kobotoke ist 521 m hoch. Er bietet eine herrliche Aussicht auf das vorliegende, reich gegliederte Gebirgsland. Es ist ein schwer zu entwirrendes Gedränge zahlloser Gipfel, das sich da aufthut. Der

Gipfel des Fuji, das vorläufige Ziel unsrer Reise, verbirgt sich in Wolken. Unten im Vordergrunde lagern höckerige, zerrissene Hügel. Wir wandern hinab zum Ufer eines zwischen hohen Steilwänden hinrauschenden, sich hie und da in tiefgrünen Grotten sammelnden Flusses, zum Ufer des Sagamigawa. Die Straſse folgt nun, indem sie sich am linken Ufer des genannten Flusses hält, auf eine Strecke hin ziemlich genau der Grenze zweier Formationen. Der vorerwähnte paläozoische Damm grenzt nämlich an tertiäres Gebiet, das sich hier hufeisenförmig nach Nordosten hin dem Kegel des Fuji anschlieſst. Innerhalb dieser tertiären Umrandung finden sich eigentümliche grüne Tuffe, welche von den Geologen der japanischen Aufnahme unter dem Namen der Misaka Series zusammengefaſst werden, und das zentrale Gebiet wird angefüllt von dioritischen Eruptivgesteinen. Bei Yoshino, das unterhab Kobotoke gelegen ist, lehnen sich die Fluſsterrassen dicht an die Berge. Weiter westwärts werden sie breiter und höher, auch flacher, plateauartig. Uenohara, ein sehr langes Dorf, liegt am Ende des weiten Plateaus. Das Wasser hat sich überall tief eingeschnitten und Schluchten mit scharfen Abrissen gegraben. Zwischen Uenohara und Saruhashi gleicht das Terrain einer wogenden See. Runde Hügel, buckelartige Hervorragungen, kurze Rücken mit geschwungenem Grat tauchen wirr durcheinander auf. Unten an den Ufern der Bäche, im Grunde der Schluchten, steht meistens noch altes Schiefergestein an. Oben aber zeigen sich mächtige Geröll- und Schuttablagerungen mit groſsen Blöcken. Auch horizontal geschichtete Sande kommen zum Vorschein, und vulkanische Aschen nehmen teil am Aufbau. Die Straſse führt bergauf und bergab, oft dicht am Rande eines Abgrunds hin. Ich hatte in Uenohara einen Omnibus gemietet, der von einem altersschwachen Klepper gezogen und von einem schläfrigen Kutscher gelenkt wurde. Die Fahrt war wenig erbaulich, denn das müde Tier taumelte oft am Rande der tiefen Abstürze, und es kostete viel Mühe, den Kutscher wachzuhalten. Zu Saruhashi, 23 km westlich von Kobotoke, kreuzt die Straſse den durch eine groſsartige, enge Felsenschlucht brausenden Fluſs. Eine hölzerne Brücke führt in schwindelnder Höhe von einem Ufer zum andern. Bis hierher hat sich ein groſser Lavastrom des Fuji ergossen, bis in die Klamm des Katsuragawa hinein, die wir auf der hohen Brücke überschreiten. Diesem Lavastrom, dessen Spuren allerdings nur hie und da sichtbar werden, folgt nun in der Richtung SW der Weg zum Fuji. Je mehr wir uns dem Fuſse des eigentlichen Kegels nähern, um so deutlicher wird der Strom. Er zeigt in der Regel eine platte Oberfläche, die hoch kultiviert ist, an manchen Stellen aber taucht es wunderlich in zackigen Formen auf und nieder. Bei Tokaichiwa ist der Fluſs auf einer Brücke zu überschreiten. Hier stürzt sich das Wasser mit Ungestüm über das Lavagefels und bildet einen kleinen Wasserfall. Das jetzige Fluſsbett scheint an dieser Stelle mit dem alten zusammenzufallen. Sonst dürfte der zu Stein erstarrte Strom das alte Bett unter sich begraben haben. Bei Shimoyoshida verläſst der Weg plötzlich die Thalsohle und wendet sich aus der Richtung SW nach W, führt etwa 160 m am Hang aufwärts und wir befinden uns in dem langgestreckten, direkt auf den südwestlich gelegenen Fujigipfel loszielenden, nicht weniger als $2\frac{1}{2}$ km langen Pilgerdorf Kamiyoshida.

Am 26. Juli früh 8 Uhr brachen wir zur Fujibesteigung auf; 5 Uhr nachmittags waren wir oben. Vom Gipfel aus bot sich eine groſsartige Aussicht über ein bedeutendes Stück des Landes. Im Westen lagen die Riesen des über 3000 m ansteigenden Akaishigebirges, nach NW öffnete sich, einer groſsen Scharte gleich, das Thor der Fossa magna. Dann kam der Yatsugatakestock, der zackige Kimposan rechts davon, weiter hinter diesem, gleich einer Krone des entzückenden Gebirgspanoramas, der rauchende Asama. Zwischen den letztgenannten Gipfeln hoben die breiten Massen des Berglandes von Kuanto an, nach O zu allmählich abschwellend und schlieſslich in der Ebene untertauchend. Fern im O und SO das Meer. Die Kontur der Küste zeichnete sich in zarten Linien, manchmal verlor sie sich auf ihrem vielfach aus- und einspringenden Wege ins Unbestimmte. Noch unbestimmter erschien die Grenze der zartgrauen Meeresfläche am Horizont. Die Inseln tauchten wie umflorte Häupter des überfluteten Landes aus dem Meere auf. Zu Füſsen des groſsen Vulkankegels, auf dessen Spitze wir uns befanden, lag ein wallförmiger Bergkranz, der in SW anhebt und sich dann um die nördliche und östliche Seite des Berges herumzieht. Die Bildung erinnert auffallend an die groſsen Einsturzkrater gewisser Vulkane. Wir haben es jedoch mit etwas ganz anderm zu thun, denn die ringförmige Umwallung unten besteht keineswegs aus Fujilaven, sondern aus Faltenzügen eigentümlicher, grüner Tuffe mit Porphyritinjektionen und Hervorragungen älterer, dioritischer Ergüsse. Es ist schon vorher des Dioritkernes im NOO des Fuji gedacht worden, der von einem Ringe grüner Tuffe wie von einer hufeisenförmigen Klammer tertiärer Gebilde umschlossen wird. Ich kann nicht umhin, diese konzentrische Anordnung in der Oberflächenverbreitung gleichalteriger Gesteine um den Stock des Tanzawa — so nennen wir nämlich den vorerwähnten dioritischen Nachbar des Fuji —, dann die ringförmige Anordnung der Tuffalten und streichenden Porphyritzüge am Fuſse des Fuji, sowie das halbringförmige Gebiet von Dioriten, welche das mit alluvialen Bildungen ausgekleidete Becken von Kofu im O umrandet, als Spuren verschiedenalteriger, aneinandertretender Einsturzkessel aufzufassen. Der jüngste dieser Einsturzkessel hat den Fuji geboren. Die Fossa magna erweitert sich nach der Auſsenseite des Gebirges hin und keilt sich aus auf der Innenseite. So können die drei erwähnten Einsturzkessel einen sehr breiten Raum in Anspruch nehmen. Ganz kolossal sind die Eruptivmassen, welche sich im S und SO des Fuji häufen. Die Halbinsel Idzu besteht fast ausschlieſslich aus Eruptivgebilden, und zwar aus solchen jüngern Alters. So chaotisch das Gewirr der vulkanischen Gipfel und Rücken auf den ersten Blick erscheinen mag, so verraten sich doch einige Spaltenwege, welche geeignet erscheinen, den Zusammenhang der Erscheinungen in der Fossa magna klarzustellen. Im SO des Fujigipfels liegt der Hoei, südsüdöstlich liegen Washinosu, Banjiro und Ashitaka. Die drei letztgenannten Gipfel bilden gleichsam eine sich aus dem Fujikörper hervorschiebende Kette. Sie gehören einem NNW—SSO gerichteten Spaltenweg an. Die gröſste Achse des elliptischen Ringkraters von Hakone fällt ebenso in die angegebene Richtung wie die Reihe der zentralen Gipfel, welche von diesem Ringkrater umschlossen werden. Ebenso findet sich diese Richtung durch die Lage und Form des Porphyritgebiets auf Idzu ausgeprägt, und die gröſste Achse der vulkanischen Insel Oshima bildet gleichsam einen Wegweiser nach der Fossa magna.

Aber wir müssen von diesem Abschweif, zu dem uns der Rundblick vom Gipfel aus verleitet hat, zu unserm Standpunkt zurückkehren, um dann wieder hinabzusteigen in das tiefere Land. Wenn wir uns von Kamiyoshida nach Nordwesten wenden, so gelangen wir nach halbstündiger Wanderung an das Ufer eines jener auſserordentlich reizvollen Seen, welche in der durch das Herantreten des Ringwalles gebildeten Rinne am Fuſse des Kegels ihr Wasser gesammelt haben. Der See Kawaguchi liegt in 800 m Meereshöhe. Am Seeufer steht fester, groſskörniger tertiärer Sandstein an, mit Konglomerat wechsellagernd. Streichen N 65 O, Fallen NW ca 30. Ein Boot führt über das klare Wasser. Drüben bei Kawaguchi zeigen sich noch tertiäre Gebilde. Es geht nun nordwärts zum Misakatoge hinauf (1570 m). Der Bergrücken setzt sich zusammen aus den grünen Tuffen der sogenannten Misaka Series. Graue, steile Felswände zu beiden Seiten des Passes bestehen aus zerklüfteten Porphyriten. Von hier aus ist Kofu leicht zu erreichen. Das in der Tiefe dahineilende Wasser, welches dem Becken von Kofu zuströmt, bietet sich als Wegweiser an. Erst bricht es durch das ringförmige Band dioritischer Gesteine, dann tritt es bald in die Ebene, vereinigt sich mit dem Fuefukigawa, und wo diese Vereinigung erfolgt, haben wir die von Tokio hierher ziehende groſse Bergstraſse erreicht, der wir nur noch ein kurzes Stück zu folgen brauchen, um in der durch fortschrittliche Bestrebungen weit im Lande berühmten Stadt ein gastliches Dach zu finden.

Die Ebene von Kofu führt viele Flüsse zusammen. Sie sammelt alle Wässer, damit diese zum Fujikawa vereint in den Felsenthoren zwischen dem Akaishi-Gebirge und Fuji alle Widerstände brechen können. Auffallend sind die grofsen Schuttkegel, welche die tief eingegrabenen kurzen Flüsse des hohen Akaishi-Sphenoids an ihrer Eintrittsstelle in die Ebene angehäuft haben. Bei Nirasaki, einem grofsen Orte 10 km nordwestwestlich von Kofu, strömen zwei breite, sandige Flüsse zusammen. Besonders der Kamanashigawa, der westliche von beiden, derselbe Flufs, der genau den Westrand der Fossa magna bezeichnet, führt kolossale Massen von Geröll und Sand. Am rechten Ufer des Kamanashi zieht eine etwa 100 Fufs hohe Terrasse hin. Die Strafse nach dem Suwa-See hält sich nun ziemlich genau an den Kamanashi-Flufs und an den Rand der Fossa. Suwa haben wir schon oben kennen gelernt. Im Jahre 1883 verliefs ich den See in einer andern Richtung als bei der frühern Gelegenheit, nämlich an der Stelle, an der sich der Ausflufs befindet, um dann mit dem gegen Süden fliefsenden Tenriugawa nach der Küste zu ziehen. Mit dem Tenriugawa trat ich damals aus der Fossa heraus.

2. Morphologische Charakteristik der Fossa magna.

In keinem Teile des ganzen Landes drängen sich die Bergmassen so dicht zusammen, in keinem andern Teile steigen sie zu so gewaltiger Höhe an wie innerhalb der Gebiete, die wir auf den vorbeschriebenen Reisen kennen gelernt haben. Und doch kann man gerade hier von einer Seite der Hauptinsel zur andern gehen, ohne sich in die Notwendigkeit beschwerlicher Pafsübergänge versetzt zu sehen. Die gröfste Höhe, die man bei der Querung von der Mündung des Fujikawa aus bis an die des Himegawa zu überschreiten hat, ist die des Shiojiritoge am Suwa-See (1025 m). Es gibt noch zahlreiche andre Querschnitte der Gebirgskette, deren Maximalerhebung über das Meeresniveau viel weniger beträgt. Es gibt ja sogar zwei quere Durchbrechungen des Meeres in der Gebirgskette, eine in der Strafse von Shimonoseki, die andre in der Strafse von Tsugaru. Aber in diesen Fällen hat man zu bedenken, dafs sich das ganze benachbarte Gebirge an tiefe Niveaus hält. Die höchsten Gipfel des Landes liegen mit Ausnahme des Fuji am Rande jener transversalen Depression, welche wir als Fossa magna bezeichnen. Das Becken von Kofu liegt an seiner tiefsten Stelle in kaum 230 m Meereshöhe, Kofu selbst 260 m. Der Fuji, der höchste Berg des Landes, mifst 3728 m. Im Westen der Fossa erheben sich im Akaishi-Sphenoid der Akaishi zu 3093 m, der Notorisan zu 3041 m und der Komagatake zu 3000 m. Der Akatake im Yatsugatake-Stock ist 2982 m hoch. Der granitische Kimpusan ragt mit 2531 m über seine Umgebung empor, und sein Nachbar, der Kokushitake, mit 2571 m. Während die drei letztgenannten Gipfel ebenso wie der grofse Fuji eigentlich in der Fossa liegen, steigen die höchsten Erhebungen des Berglandes von Kuanto nur in einigen wenigen Fällen, z. B. in dem Kokushiyama, zu nahe 2500 m Höhe an. Sonst halten sie sich in der Nähe der Fossa an Niveaus zwischen 2200 und 2000 m und werden nach Norden von der Fossa aus und auch nach Osten zu allmählich niedriger. Die Gegend von Matsumoto liegt schon bedeutend niedriger als der Suwa-See. Ihr Niveau bestimmt sich zu 690 m. Der Weg von Omachi nach Itoigawa führt über einen Pafs von nur wenig über 600 m Höhe. Direkt westlich aber von dieser Strafse wachsen wieder riesenhohe Berge in langer Kette auf: der Renge mit 2990, der Tate mit 2850 und der nadelförmige Fels des Yarigatake mit 3050 m. Östlich von der tief einschneidenden Rinne beansprucht ein grofser Vulkanstock breiten Raum. Er hat Gipfel von nahezu 2200 m. Auch diese Vulkane entwachsen wie Yatsugatake, Fuji u. a. der Fossa magna.

Es erscheint bemerkenswert, dafs sich unter allen vulkanischen Gipfeln der Fossa magna und ihrer Nachbarschaft nur der Fuji durch eine ganz besonders hervorragende Höhe auszeichnet. Auf den Fuji folgen der Höhe nach eine Reihe von Bergspitzen, welche dem westlichen Rande der Fossa angehören und nicht vulkanisch sind. Es sind also hier in der Bruchregion die äufsersten Hervorragungen des alten Gebirges etwas höher als die vulkanischen Spitzen, wobei der Fuji die einzige Ausnahme bildet. In den übrigen Abschnitten der japanischen Inseln überragen die Vulkane in der Regel weitaus das umliegende Land. Wenn wir uns aus der Fossa magna sämtliche Vulkanberge entfernt denken, so bleibt eine sehr breite transversale Depression übrig mit sehr scharfer westlicher Begrenzung, mit Scharen von Bergriesen auf der Westseite. Auf der Ostseite ist die Begrenzung etwas verworren, jedenfalls ziemlich unregelmäfsig, und auf dieser Seite liegen keine so grofsen Höhen des alten Gebirges. Die breite Depression erinnert in ihrer Gestaltung an die Form eines Grabens. Deshalb habe ich die Bezeichnung „Fossa" in Anwendung gebracht. Durch die lateinische Version der Benennung, mit welcher nur auf eine Formenerscheinung hingewiesen werden soll, durchaus nicht auf die Entstehung, ist jedenfalls einer Verwechselung mit dem geologischen Begriff einer Grabenbildung vorgebeugt, und aufserdem wird sich der Name Fossa magna leichter in den verschiedenen Sprachen, besonders in der japanischen, Eingang verschaffen können, als es ein deutsches Wort im stande wäre.

3. Die Fossa magna als Gebirgsglied und ihre Deutung.

Versuchen wir es, den innern Bau des ganzen Gebirges an der Hand des beigegebenen Stereogramme zu durchschauen, so wird uns zunächst das eine klar, dafs sich vom äufsersten Südwesten her, von Amakusa durch Kiushiu und Shikoku, durch die Kii-Halbinsel, am Rande des Akaishi-Sphenoids, dann nach einer Unterbrechung der Fossa magna längs des Berglandes von Kuanto über die Tsukuba-Berge, ferner am Rande des Abukuma und das Kitakami-Thal hinauf ein Streifen kristallinischer Schiefer verfolgen läfst, der, wie ich schon mehrfach hervorgehoben habe, nichts andres vorstellt, als das Analogon des Zentralmassivs der Alpen und andrer Gebirge. Diese lange, wie eine grofse Mauer durch das ganze Land ziehende, gleichsam das Rückgrat des ganzen Gebirges bildende Zone hat eine Art Brustwehr gegen das Emporquellen heifsflüssiger Massen gebildet, denn neben ihr herlaufend finden wir nach innen zu, auf der Seite des Japanischen Meeres, die weit ausgedehnten Spuren massiger Emporquellungen aus den verschiedensten Zeitaltern. Das ganze Gebiet, welches die Mauer kristallinischer Schiefer und alles was aufserhalb davon gelegen ist, umfafst, ist arm an eruptiven Quellungen. Wo sich die Anordnung der Eruptivmassen an langgestreckte Linien bindet, da sind Spalten der Erdkruste zu suchen. Eine Längsspalte begleitet unzweifelhaft das ganze Japanische Gebirge. Auf der Aufsenseite dieser Spalte ist der ganze Bau in so hohem Mafse verdichtet und verfestigt, dafs Kommunikationen mit den tiefer gelegenen Herden heifsflüssiger Masse nur ausnahmsweise eröffnet werden konnten. Für das Bestehen einer sehr tiefen Spalte längs der Inlandsee und auch weiter über das Gebiet dieses Binnenmeeres hinaus, westwärts bis Amakusa hin und östlich bis in die Nachbarschaft von Hiogo und bis zum Futagoyama, liefert auch die Verbreitung petrographisch hochinteressanter vulkanischer Gesteine einen Beweis. Es sind Granat führende Andesite und Trachyte, sowie eigentümliche Bronzitgesteine (Sanukit), welche sich an diese lange Linie binden[1]). Ebensowenig wie an der Längsspalte gezweifelt werden kann, ebensowenig kann man sich der Thatsache verschliefsen, dafs die gebirgsbildenden Bewegungen im Japanischen Gebirge einseitig gewesen sein müssen, und dafs die Bewegungen von der Seite des Japanischen Meeres her erfolgt sind. Eine Prüfung des Streifens kristallinischer Schiefer wird das beweisen. Der Streifen ist zerrissen und die verschiedenen Stücke sind ungleich weit gegen den Ozean vorgeschoben. Den deutlichsten Beweis für eine Vorwärtsbewegung in dem angegebenen Sinne, für eine Stauung der Schichtenmassen durch einseitigen Schub, gibt aber die eigentümliche Hemmung der Falten in der Fossa magna. Sueſs[1]) deutet diese Hemmungserscheinung als Scharung. Darunter versteht er die Erscheinung, welche eintritt, wenn vorrückende Gebirge aneinandertreten, um sich gegenseitig in ihrer Vorwärtsbewegung zu hemmen, so daſs scharf einspringende Winkel entstehen, wie z. B. bei Hindukusch und Himalaya. Ich habe schon früher betont, daſs an eine solche Erklärung im Falle des japanischen Gebirges nicht gedacht werden könne. Nord- und Südflügel der ganzen Kette lassen sich nicht voneinander trennen. Aneinandertreten zweier Gebirge, Hemmung an der Berührungsstelle, Scharung, das alles ist nur denkbar, wenn die Mittelrichtungen der faltenbildenden Kräfte konvergieren, nur dann kann ein Zusammentreten erfolgen. Im Falle des japanischen Gebirges findet nun Divergenz der Kraftrichtungen statt. Es ist, als ob nur die Annahme übrig bleibe, der Bogen müsse ursprünglich einmal einen ungestörten Verlauf eingehalten haben. Erst später kann ein Hemmnis eingetreten sein, welches die Fossa magna erzeugte. Das Herantreten der Shichito-Kette an das Japanische Gebirge gerade dort, wo die Fossa magna von einer Seite zur andern läuft, wird schwerlich als Zufall hinzunehmen sein. Auch können die Sieben Inseln und ihre südlichen Geschwister nicht als die Spitzen eines *vulkanischen* Seegebirges aufgefaſst werden. So groſse Massen vulkanischen Gesteins, wie sie bei Annahme eines so groſsen vulkanischen Gebirges herauskommen würden, existieren nicht über dem Wasser, warum sollen sie *unter* dem Wasser existieren? Man verfällt sehr leicht in den Fehler, einen tektonischen Unterschied anzunehmen für solche Teile der Erdkruste, die über dem Wasser liegen, und solche, die unter dem Wasser liegen. Das ist aber durchaus ungerechtfertigt. Das Meeresniveau spielt hier die Rolle der Zufälligkeit. Warum sollten sich unter dem Meeresboden nicht dieselben faltenbildenden Vorgänge abspielen können wie in den Gebirgen der Kontinente? Es mag ja Senkungsfelder geben innerhalb der Ozeangebiete, aber deshalb brauchen wir durchaus noch nicht überall dort Senkungsgebiete zu suchen, wo die Meeresflut die Erdfeste verhüllt. Ist die Shijito-Kette nicht vulkanisch, sondern liegt hier ein Faltengebirge vor, so muſs irgend einmal ein Zusammentreten der Bewegungen des Japanischen Gebirges und des Shichito-Gebirges erfolgt sein. Welche Erscheinungen standen nun im Gefolge dieses Zusammenwirkens? *Ich kann mir die Fossa magna auch jetzt nur als die Spur einer groſsen Zerreiſsung, einer groſsen Querspalte erklären*, bedingt durch das Herantreten der Bewegung in dem durch die Sieben Inseln angezeigten Faltenzuge[2]). Die Anordnung der Vulkane in der Fossa deutet unbedingt auf eine Spalte hin. Und wenn im Becken von Kofu, in der wallförmigen Umgrenzung des Fuji und im Tanzawa-Stock die Anzeichen kesselförmiger Senkungen vorliegen, so schlieſsen diese Kesselbrüche eine Spalte keineswegs aus. Erinnert man sich des groſsen Längsrisses, welcher in der Mitte des Japanischen Gebirges hinzieht und dort, wo die Fossa magna über das Gebirge setzt, eine energische Rückbiegung beschreibt, ebenso wie es die Falten thun, und würdigt man die Unterbrechung des Längsrisses durch die Fossa — eine solche Unterbrechung liegt unleugbar vor —, so bestimmt sich das Alter der Querspalte auf dieselbe Weise, wie sich das relative Alter zweier sich kreuzender Verwerfungen bestimmt: *die Querspalte ist jünger als die Längsspalte*.

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[1]) Weinschenk, E., Beiträge zur Petrographie Japans. Neues Jahrb. f. Min. &c. Beilageb. VII. 1890. S. 133.

Ich halte die Rückbiegung der Falten und der Eruptionszüge für eine *Folge* der Fossa magna. Sueſs hält den zurückspringenden Winkel der Falten *für die Ursache* der Fossa magna.

Die Fossa magna ist da. Sie kann von niemand geleugnet werden. Aber sie wird verschieden erklärt. Nach Sueſs ist sie Einbruch in der Scharungsstelle, nach meiner Auffassung Spalte, Ursache der Faltenhemmung. Die Sueſssche Erklärung läſst die Frage offen, wie die Scharung entstanden sei. Denn durch ein Aneinandertreten verschiedener Gebirge kann sie nicht entstanden sein. Die Bewegungsrichtungen divergieren ja nach auſsen hin.

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[1]) Antlitz der Erde, Bd. II, S. 225.

[2]) Vgl. meine frühern Darlegungen in: Bau und Entstehung der japan. Inseln (Berlin 1885). Über die Geologie Japans. Extrait du Compte rendu de la III^me Session du Congrès Géol. international (Berlin 1885). Die Erscheinungen des Erdmagnetismus in ihrer Abhängigkeit vom Bau der Erdrinde (Stuttgart 1887). Geol. Karte in den Mitteil. der Wiener Geogr. Ges. (Wien 1887).

Schon im Jahre 1887 veröffentlichte Sueſs in dem akademischen Anzeiger der Wiener Akademie einen Brief Haradas [1]), in welchem letzterer der Sueſsschen Auffassung zustimmt. Harada betont dabei, daſs ihn die genauere Untersuchung des Gebietes seit meinem Abgang von Japan zu dieser Auffassung geführt habe. In dieser ersten Publikation sowohl wie in der spätern faſst Harada die technischen Ausdrücke nicht immer so genau, wie es notwendig erscheint. Den Suwa-See z. B. bezeichnet er als Maar, womit bei dem mit japanischen Verhältnissen nicht ganz eingehend vertrauten Leser der Eindruck hervorgerufen werden muſs, als ob wir es im Falle des Suwa-Ko mit einer Bildung zu thun hätten analog denen, die für die Eifel so charakteristisch sind. Der See stellt einfach ein sehr flaches Becken dar mit sanft geböschten Ufern und ist als eine durch Abdämmung entstandene Wassersammlung anzusehen. Maare finden sich ja sonst in Japan sehr vielfach. Ich will da hinweisen auf das schöne Maar am Fuſse des Kaimontake, auf ein Maar im Tateyama-Kessel, die eigentümlichen Bildungen des Bandai und das erst in ganz neuer Zeit entstandene Maar des Shirane bei Kusatsu. Letzteres ist im Jahre 1881 durch Explosion gebildet worden, erscheint also für die Entstehungsgeschichte verwandter Bildungen von höchster Bedeutung. Ein Maar von 5 km Durchmesser — so groſs ist der Suwa-See — ist mir auf der ganzen Erde nicht bekannt.

Schon als ich nach vierjähriger angestrengter Arbeit und nach neunjährigem Aufenthalte in Japan eine Zusammenstellung meiner Beobachtungen unternahm, war mir der ringförmige Wall des Fuji mit seinen konzentrischen Dioritzügen wohl bekannt. Später, gelegentlich eines in der Deutschen Gesellschaft gehaltenen Vortrags, versuchte ich, die dioritischen Durchbrechungen als peripherische Brüche eines Senkungsfeldes zu deuten, und ich bin auch jetzt noch der Ansicht, daſs sie als solche Bildungen aufzufassen sind. Die konzentrischen Fujibogen bilden den einzigen Stützpunkt, der für eine Verbindung des Akaishisphenoids mit dem Kuantogebirge beigebracht wird. Sie dürfen aber nicht als beweiskräftig gelten; denn eine faktische Verbindung wird nicht hergestellt. Die Misaka Tenshufalten, wie sie von Harada genannt werden, und die zugehörigen Gangmassen zeigen sehr innige Abhängigkeit vom System des Fuji. Eine Prüfung der Karten wird ergeben, daſs sie mit diesem Berge sehr eng verbunden sind, während die gleichalterigen Tuffe, die Gebilde der Misaka Series im Westen des Fujikawa und Kamanashikawa, ein ganz entschiedenes nordsüdliches Streichen bekunden. Warum lenken denn die Falten, wo sie westlich von der Fossa an diese herantreten, nicht so um, wie es die Scharung verlangt? Da sollte doch ein Parallelismus mit den konzentrischen Bogen des Fuji zu erkennen sein. Warum brechen denn die Faltengänge nicht so am Rande der Fossa ab, daſs sie in diese hineinstreichen würden? Warum erscheinen sie an diese angedrückt wie eine Stahldegenklinge gegen ein festes Widerlager? Was die nach Harada am Süd- und Westfuſse des Yatsugatake unter tertiären und posttertiären Auswurfsmassen hervorblickenden paläozoischen Thonschiefer und Grauwacken betrifft, so sind mir solche nur im Südosten bekannt, sobald die alten Sedimente des Akaishisphenoids nicht in Betracht kommen sollen.

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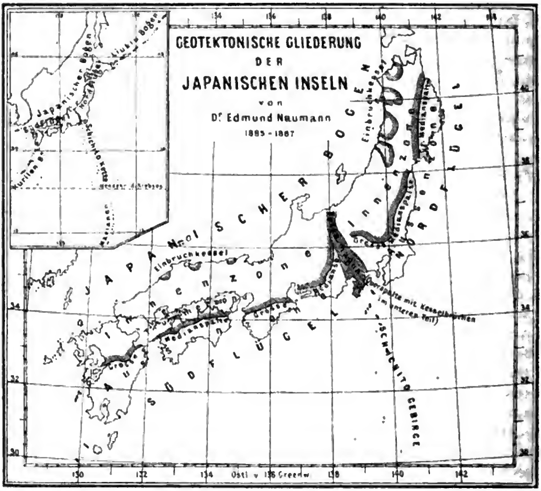
[1]) Akad. Anzeiger Nr. XVII (Wien 1887). Vgl. auch Naumann, Fujisan. Jahresbericht der Geogr. Ges. in München für 1887 (München 1888), S. 9. Ferner Naumann u. Neumayr, Zur Geologie und Paläontologie von Japan, LVII. Bd. der Denkschr. der math.-naturw. Klasse der K. Ak. d. Wissensch. Wien (1890), S. 24. Harada, Versuch einer geotektonischen Gliederung der japan. Inseln (Tokio 1886). Ders., Die japan. Inseln. Eine topogr.-geol. Übersicht, 1. Lief. (Berlin 1890). Naumann, Neuere Arbeiten der Kais. japan. geol. Reichsanstalt. Das Ausland 1891, S. 357 u. 374. Die letztere Abhandlung enthält eine Kritik über Haradas „Japanische Inseln“.

Wenn behauptet wird, das Verhältnis der „Scharung" des südjapanischen Aufsenbogens mit dem nordjapanischen sei ganz das Miniaturbild der Scharung des Hindukusch und des Himalaya im untern Indusgebiet, so ist dem vor allem entgegenzuhalten, dafs die Falten am Jhelam und Indus aus dem einen Gebirge in das andre ohne Unterbrechung verfolgt werden können, und dafs hier keine Eruptiverscheinungen an der Begegnungsstelle wahrzunehmen sind, während zwischen Nord- und Südflügel des japanischen Gebirges eine Lücke unbedingt vorhanden ist und die grofsartigsten Eruptiverscheinungen gerade längs der Linie auftreten, welche die beiden Flügel voneinander trennt. Jeder Einbruch setzt eine Raumerweiterung voraus. Aber bei Gebirgen, welche sich scharen, ist eine Raumerweiterung jedenfalls dort am allerwenigsten geboten, wo die Scharung erfolgt. So suchen wir denn an der Berührungslinie von Hindukusch und Himalaya vergebens nach sekundären Einbrüchen und vulkanischen Ergüssen. In Japan dagegen mag das Eingreifen der Schichitobewegungen zuerst eine Spalte erzeugt haben, deren Ausfüllung durch Eruptivgebilde sich dann wie ein keilförmiges Widerlager den vorrückenden Falten entgegensetzte, und der fortdauernde Einflufs des Wachstums im Nachbargebirge mag dann auch die Bedingung geboten haben für die Entstehung jener merkwürdigen, halbzerstörten oder von Erdblutungen überwucherten Einbrüche, wie wir sie im Becken von Kofu, im Fujibezirke und im Tansawastock vor uns sehen.

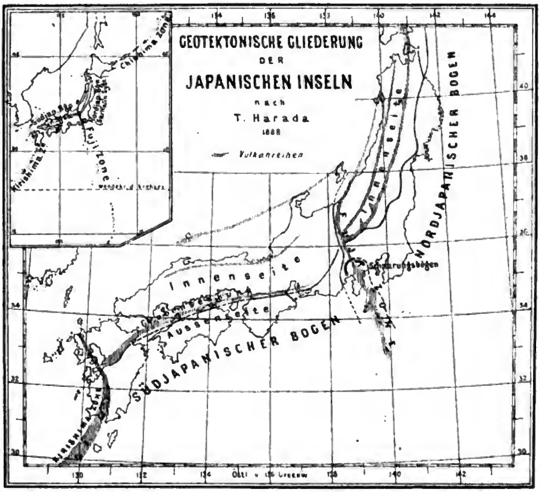
In seinem „Versuch einer geotektonischen Gliederung der japanischen Inseln" gräbt Harada den so ziemlich ad acta gelegten Begriff des Sinischen Gebirgssystems wieder aus. Dazu stellt er ein neues „System", das „Sachalinsystem", auf. Nach seiner Auffassung würde jede Anschwellung der Erdoberfläche, welche sich durch eine besondere Richtung auszeichnet, als „System" aufzufassen sein. Nun lehrt aber die Erfahrung, dafs es Richtungen gibt, die sich in der Horizontale unablässig ändern, und bogenförmig sind ja die meisten Gebirge. Wer einen Bogen, wie den japanischen, in geradlinige Elemente aufzulösen sucht, ehe er die innern Verhältnisse beleuchtet und durchschaut hat, der thut der Natur einen Zwang an, der schematisiert. Nord- und Südflügel des japanischen Bogens zeigen einen ganz gleichmäfsigen Aufbau. Sie setzen sich aus genau denselben Gebilden zusammen, und die gleichalterigen Gebilde der beiden Flügel waren in der Hauptsache genau denselben tektonischen Beeinflussungen unterworfen. Daran ist nicht zu zweifeln und nicht zu deuteln. Harada hat mich offenbar falsch verstanden. Er hat den Namen „Grofser Graben" oder „Fossa magna" so aufgefafst, als ob ich darunter einen zwischen zwei Sprüngen zu tief gesenkten Streifen verstanden wissen wollte. Es ist mir aber durchaus nicht darauf angekommen, die Unterordnung der Erscheinung unter einen geologischen Begriff vorzunehmen. Ich habe bei den verschiedensten Gelegenheiten ausdrücklich hervorgehoben, dafs ich die Fossa magna als Spalte ansehe.

Wenn nun Harada bei seinem Versuch einer Gliederung des Japanischen Gebirges eine Fujizone aufstellt, so sollte er sich vor allem daran erinnern, dafs Zone Gürtel ist, dafs es etwas sein mufs, was sich dem ganzen Gebirge anschliefst, und dafs es nichts sein kann, was als fremdes Element nur in das Gebirge eingreift. „Das japanische Gebirge ist ein Gebirge von zonalem Typus." Bei der Zerlegung des ganzen Gebirgsstreifens in Zonen bin ich nur frühern Beispielen gefolgt und habe mich z. B. daran erinnert, dafs man in den Alpen von einer Kalkzone, von einer Flyschzone &c. spricht. Harada nun vermeidet in seiner ersten Publikation (Versuch &c.) auf das ängstlichste, den Begriff Zone auf die Gliederung des japanischen Bogens selbst anzuwenden, und appliziert ihn auf die fremden Bogen, welche von Süden oder Osten her an ihn herantreten. Er spricht von einer Kirishimazone, und zu seiner „Fujizone" gehört nicht nur das, was ich Fossa magna genannt habe, sondern auch das ganze Shichitogebirge. Die Kette der Liukiu-Inseln stellt ebensowohl ein selbständiges Gebirge vor wie die Kette der sieben Idzu-Inseln, die Kette der Shichito und ihre Verlängerung. Wenn wir diese beiden letztgenannten Anschwellungen des Erdfesten als Zonen bezeichnen sollten, müssen wir auch das japanische Gebirge selbst als Zone bezeichnen. Darauf, daſs in dem Liukiugebirge sowohl wie in dem Shichitogebirge verschiedenalterige Sedimente vorhanden sind, wird vorläufig kein groſses Gewicht gelegt. Sehr künstlich konstruiert ist die Verlängerung der sogenannten Kiushiuzone mitten durch Kiushiu. Ich habe früher betont, daſs es in Kiushiu kein meridianes Gebirge gebe, wie es früher angenommen worden ist, und muſs von neuem die Bedeutung des Durchgreifens der von Osten an Kiushiu herantretenden Zonen hervorheben. Auch auf Yezo findet ja ein derartiges Durchgreifen statt. Gerade dieses Verhältnis beleuchtet die Rolle, welche der Japanische Bogen den kontinentalen Gebirgen gegenüber spielt. Er gehört eben zu dem Kontinent, er stellt ein Stück jenes groſsartigen Bogens vor, von dem auch der Ural und der Himalaya Teile sind.



Das „Ashiogebirge“ oder Ashiobergland, wie ich es nennen möchte, gehört gewiſs nicht zur Auſsenzone. Die Grenze zwischen Auſsen- und Innenzone liegt überall an der Innenseite des Zentralmassivs und zieht auch am Rande des Berglandes von Kuanto hin. Die sehr schön regelmäſsig nebeneinander hinlaufenden Spaltenwege, wie sie Harada in seiner Karte aufführt, existieren in der Natur nicht. Um das einzusehen, fasse man nur die Entfernung zwischen Kampusan und Kakudayama ins Auge. Auch ist es schwer zu verstehen, wie jemand aus drei durch vulkanische Eruptionen ausgezeichneten, aber weit voneinander abgelegenen Punkten, wie Oki, Noto und Sado, gleich eine Spalte herleiten kann. Da werden eben wieder künstliche Linien konstruiert. Auf die Erklärung, welche ich früher gegeben habe, und nach welcher Iwaki, Moriyoshi, Chokai und Gassan als groſse Einbruchskessel des Innenrandes hingestellt werden, wird absolut keine Rücksicht genommen. Ich habe die genannten Vulkane früher mit Früchten verglichen, welche den Seitenästen des Hauptstammes entwachsen.

„Die Fujizone“, sagt Harada, „stellt sich als eine an vulkanischem Leben reiche Zone dar. Wo sie den Rumpf von Honshiu durchsetzt, charakterisiert sie sich in schönem Einklang mit dem, was Ed. Suefs ausgesprochen hat, als eine an Einbrüchen und vulkanischen Ausbrüchen reiche Scharungsstelle des nord- und südjapanischen Bogens, welche nur gegen das Ostende des letztern durch einen scharfen Bruchrand abgegrenzt wird. Sie ist keineswegs als eine typische Grabensenkung oder Fossa magna, wie sie Edmund Naumann bezeichnet, aufzufassen und bedingt keine abrupte Scheidung zwischen den beiden Bogen der japanischen Inseln.“



Ich führe diese Worte an, um mich gegen eine falsche Auslegung meiner früheren Darlegungen zu verwahren, um meinen Standpunkt deutlicher kennzeichnen zu können und künftigen Verwirrungen vorzubeugen. — „Die Schubrichtungen, welche die Faltungen beider Flügel des japanischen Gebirges erzeugt haben“, sagte ich früher, „weisen auf die zentralen Gegenden des Japanischen Meeres zurück und schneiden sich in diesen Gegenden. Ich kann mir den Fall der ‚Scharung‘ nur dann vorstellen, wenn die Schubrichtungen nach rückwärts divergieren, nach vorwärts konvergieren. Bei dem japanischen Gebirge ist das umgekehrte der Fall. Ich glaube jetzt wie vorher behaupten zu dürfen, dafs die Fossa magna eine Spalte, eine Zerreifsung darstelle, keinen jugendlichen Einbruch, eine Spalte sogar, die von hohem Alter ist, wenn auch jünger als der longitudinale Hauptbruch des ganzen Gebirges.“ — Diese Worte haben Harada vorgelegen. Er citiert meine Abhandlung, in der sie enthalten sind, dennoch schiebt er mir die Auffassung einer typischen Grabensenkung unter. Ich habe Nordflügel und Südflügel nie als verschiedene Gebirge aufgefaſst, sondern immer und immer wieder auf die Analogie in bezug auf Zusammensetzung und Bau der beiden Seiten hingewiesen. Wenn Harada mit Sueſs übereinstimmen will, so muſs er zwei Gebirge annehmen, die aneinander treten, um sich zu scharen, und er hat ja auch zwei verschiedene Systeme, das Sinische und das Sachalinsystem, aufgestellt.

Es möge mir nunmehr gestattet sein, die Übereinstimmungen und Abweichungen zwischen meiner und Haradas Darstellung noch etwas eingehender zu behandeln. Ich glaube um so weniger hiervon Abstand nehmen zu sollen, als eine gewisse Verwirrung in der Terminologie sowohl wie bezüglich der gebirgsbildenden Vorgänge, welche den japanischen Bogen und seine Gliederung erzeugt haben, hereinzubrechen droht. Zum Zwecke klarer Einsicht in die hier zu berührenden Verhältnisse gebe ich die folgenden graphischen Darstellungen, welche für sich reden mögen.

Aus diesen Skizzen dürfte zunächst soviel hervorgehen, daſs sich meine Auffassung einfach und ungezwungen den Thatsachen anschmiegt, und daſs meine Terminologie konsequent ist. Das Weitere ergibt sich aus folgender Zusammenstellung:

Naumann.	Harada.
Wenn man die Vulkane mit Perlen vergleicht, und die Inselreihen mit Blumenguirlanden, so sind die Vulkane nicht mehr als den Blumenguirlanden eingestreute Perlen. Auch im Meere sind Vulkane Attribute groſser Gebirge. Die Baustücke der japanischen Inselkette ordnen sich nach Zonen, welche der Hauptsache nach aus gefalteten Schichtenmassen bestehen. Der Riukiubogen und der Kurilenbogen müssen von sehr jugendlichem Alter sein.	O. Peschel vergleicht die vulkanischen Kurilen mit einer Perlenschnur, ebenso die Riukiuinseln. Unter den vier Gebirgsbogen (Kurilen, Riukiuinseln, nord- und südjapanischer Bogen) tragen die beiden japanischen den Charakter eines zonalen Faltungsgebirges am deutlichsten zur Schau, während in den Riukiuinseln vorwiegend nur Stücke der Auſsenzone und in den Kurilen nur die vulkanischen Aufschüttungen der versenkten innern Zone einer Kordillere, deren Auſsenzone an der Ostküste von Kamtschatka sichtbar ist, über dem Meere hervorragen.
Die fremden Bogen der Riukiu und Kurilen bringen allerdings Modifikationen des Baues hervor, aber sie sind nicht im stande, die fundamentalen Gesetze des Baues zu stören. Die Auſsenzone des japanischen Bogens greift in beiden Fällen durch.	Während die Scharung der drei südlichen Bogen thatsächlich festgestellt ist, ist das Verhältnis zu den Kurilen und dem nordjapanischen Bogen noch nicht klargelegt.
Mit dem Himalaya und dem Ural bildet der japanische Bogen einen groſsen kreisförmigen Wall. Er stellt eines der gröſsten Gebirge unsers Planeten vor und bildet den eigentlichen Grenzdamm des asiatischen Erdteils.	Die japanischen Inseln gehören zu jenem groſsen Halbkreis von Gebirgslinien, welcher in dem merkwürdigen Gebirgsknoten von Pamir beginnt, über den Himalaya, über Süd-China und den japanischen Archipel bis Kamtschatka hinzieht und den eigentlichen Körper gegen auſsen, d. h. gegen das indische und pazifische Becken abschlieſst.
Der breite Gebirgsbogen zerlegt sich durch eine in dem Oberflächenbild der Verbreitung der Formationen deutlich ausgeprägte mediane Linie in zwei Streifen (Zonen), die wir als äuſsern und innern Streifen (Zone) unterscheiden wollen[1].	Man kann drei groſse Zonen unterscheiden: eine äuſsere Sedimentzone, eine mittlere Zone von Gneiſs und kristallinischen Schiefern und eine innere Sedimentzone[2].
Längs des ganzen Bogens verläuft eine mediane Linie (an der Innengrenze des Zentralmassivs), welche einen durch groſsartige Eruptionen aus den verschiedensten Zeitaltern ausgezeichneten innern Streifen von einem äuſsern, an Eruptionen auſserordentlich armen scheidet. Was läge näher, als hier unter diesem Bogen eine mächtige, tief in die Erdkruste einreiſsende, längs des ganzen Gebirges hinziehende alte Spalte zu suchen? Direkt innerhalb der Medianlinie ist eine weitgehende Zerstückelung zu bemerken.	Eine zum gröſsten Teil durch topographische Furchen und durch Längsabbrüche bezeichnete Linie zieht sich mitten durch die ganze Längserstreckung des Inselbogens hindurch. Sie scheidet eine durch Regelmäſsigkeit des gefalteten Aufbaues und durch Armut an Eruptivmassen ausgezeichnete ozeanische oder Auſsenseite von einer durch das gegenteilige Verhältnis charakterisierte Innenseite, welche zu den zerrissensten und zerbrochensten der Erde gezählt werden muſs.

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[1] Anfangs habe ich eine Auſsenzone, eine Mittelzone (dem durch eine weitgehende Zertrümmerung und Zerstückelung ausgezeichneten Binnenmeere entsprechend) und eine Innenzone unterschieden. Diese Einteilung habe ich jedoch aufgegeben, weil sich die Mittelzone nicht durch den ganzen Bogen verfolgen läſst und weil dort, wo sie entwickelt ist, ihre Abgrenzung gegen die Innenzone (im frühern Sinne) zu verworren erscheint.

[2] In seiner ersten Publikation „Versuch einer tektonischen Gliederung &c.“ wendet Harada die Be-

Naumann.	Harada.
Dort, wo im Scheitel des Gebirgsbogens die Kette dem Ozean entgegentritt, und wo der Anschluſs des nach den Bonininseln hinunterziehenden Gebirges der sieben Inseln (Shichito) erfolgt, zieht eine groſse Depression quer von einer Küste zur andern. Ich habe sie Fossa magna genannt. Sie zeigt einen mächtigen Keil von Eruptivgesteinen an, der sich in das Gebirge hineindrängt und an dem sich die vorrückenden Faltenzüge zu dichtgedrängten und wenigstens auf der Südwestseite hoch aufsteigenden Massen gestaut haben. Diese Fossa ist nichts andres, als eine tief einreiſsende, blutende Wunde der Erdkruste, eine *quere* Zersprengung des Inselbogens. Die Zersprengung hat gerade dort stattgefunden, wo ein andres groſses Gebirge, das ich mit dem Namen „Shichitokette" belegt habe, an den japanischen Bogen herantritt und mit ihm verwächst. Den Bewegungserscheinungen, die dieses Gebirge hervorriefen, die sein Wachstum bedingten, haben wir die Zersprengung des japanischen Inselbogens zuzuschreiben.	Ein zweites mächtig in die Bodengestaltung Japans eingreifendes tektonisches Moment ist die an vulkanischen Erscheinungen auſserordentlich reiche Fudji-Bruchzone. Sie kann als eine quere Zone von Bruchsystemen aufgefaſst werden, längs welcher die nördliche Scholle gegenüber der südlichen abgesunken ist[1], und erstreckt sich über 25 Breitengrade bis zu den vulkanischen Marianen. In dem vom Fudji nördlich gelegenen Teile dieser Störungszone findet die Scharung des Sachalin- und des Sinischen Systems statt.
In dem westlich von der medianen Kette gelegenen Inselstreifen von Nord-Japan liegen vier groſse Kessel mit je einem Vulkan. Der mediane Hauptstamm des Gebirges entsendet Äste nach Westen, welche aus alten Gesteinen aufgebaut sein müssen. Es kann keinem Zweifel unterliegen, daſs die vier groſsen kesselförmigen Depressionen von Nord-Japan durch Einbrüche entstanden sind. Sie bilden die Analoga der Einbruchskessel, welche am Innenrande von Chugoku liegen.	Es ergibt sich für die Innenseite des nordjapanischen Bogens eine rostförmige Anordnung der Oberflächenformen. Die mittlere Depressionszone bildet deshalb keine fortlaufend einheitliche Mulde, zerteilt sich vielmehr in eine Anzahl von kesselförmigen Senken. Die Vulkane, welche in so groſser Anzahl und in so hohem Maſse zur Charakteristik der Innenseite Nord-Japans beitragen, zeigen auf Honshiu eine Anordnung in drei Parallelreihen[2].
Die Tenshiu-Misakafalten schlieſsen sich den Peripheriesprüngen des Fudji-Einbruchskessels an. Eine Verbindung zwischen nord- und südjapanischem Flügel ist nicht nachgewiesen[3].	Das Misakagebirge ist ein Ausläufer des Quantogebirges, das Tenshingebirge eine Vorkette des Akaishigebirges; die von diesen beiden Gebirgen gebildete bogenförmige Linie wäre also nichts andres als ein Scharungsbogen der nord- und südjapanischen Auſsenseite.

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zeichnung „Zone" auf die longitudinale Gliederung des Gebirges nicht an. Er spricht hier nur von einer Fudjizone und einer Kirishimazone. Die Durchführung der mittlern kristallinischen Zone durch das ganze Gebirge gelingt nicht, da der Gürtel an dem Nordflügel nicht mehr verfolgt werden kann. Auch aus diesem Grunde wäre also die vorgeschlagene Gliederung zu beanstanden.

[1] Liegen denn für eine solche Absenkung der „nördlichen Scholle" irgendwelche Beweise vor! Es wäre interessant, etwas von solchen Beweisen zu hören.

[2] Sämtliche Vulkanreihen der Karte sind durchaus unberechtigt. Es liegt nicht der mindeste Grund vor, die Vulkanreihen so aus der Fossa magna herauswachsen zu lassen, wie es Harada gethan hat. Die Vulkane der Innenseite des Nordens und des Südens sind eben, wie ich nachdrücklich betont habe, Wucherungen aus Einbruchskesseln. Die Kessel sind deutlich genug entwickelt, um in dieser Beziehung keinen Zweifel aufkommen zu lassen, und auch die Entwickelung der einzelnen Vulkane in den Kesseln ist deutlich genug. Harada scheut sich nicht, Verbindungen zwischen Ausbruchspunkten herzustellen, welche über 200 km auseinanderliegen! Das ist doch etwas zu kühn. Die hellroten, als Vulkanreihen bezeichneten dünnen Streifen der Karte sollen wohl Spalten bezeichnen? Wenn dem so ist, dann liegt ja dem Teile der Haradaschen Fudjizone, welcher meiner Fossa magna entspricht, eine Spalte zu Grunde. Also die Scharung würde zerschnitten sein durch eine Spalte. Hat es nicht den Anschein, als ob meine Darlegungen nicht richtig erfaſst worden wären, und als ob gerade die Haradasche Karte einen unbewuſsten Anschluſs an meine Auffassung bekundete? Die Verzweigung der Idzu-Shichitospalte in der Gegend des Suwako- und Asamagebiets muſs entschieden fallen, denn auch die von Harada redigierte II. Sektion der Übersichtskarte gestattet so und so viele andre Verbindungen der Eruptionszentren zu Spaltenwegen. Wie soll man sich übrigens das eigentümlich gabelförmige Eingreifen der vulkanischen Spalten in das japanische Faltengebirge vorstellen und erklären? Muſs nun die dreizackige Gestalt des Spaltensystems fallen, und läſst man die Spalte der „Fudjizone" gegen das Japanische Meer hinauslaufen, so kommt die Haradasche Darstellung im wesentlichen ganz und gar auf das hinaus, was ich bezüglich der tektonischen Gliederung der japanischen Inseln schon bei so und so vielen Gelegenheiten vertreten habe. Bezüglich der Einbruchskessel am Innenrande des ganzen Gebirges möchte ich noch darauf hinweisen, daſs ich diese Kesselbildungen mit nur zwei Ausnahmen kenne. Ich habe sie durchschritten und von hohen Berggipfeln aus Übersichten genossen. Schon aus diesem Grunde verdient wohl mein Urteil über die merkwürdigen Bildungen, das von Harada vollständig ignoriert wird, einige Beachtung. Soviel mir bekannt ist, kennt Harada die Kessel nicht aus eigner Anschauung, und ich muſs dies auch deshalb stark bezweifeln, weil eine so groſse Übereinstimmung der Haradaschen Karte mit der meinen doch schwerlich hervortreten könnte, wenn auch er überall da gewesen wäre, wo ich gewesen bin.

[3] Dieser Passus entstammt einem Vortrage, welchen ich in der Ostasiatischen Gesellschaft über den Pseudozirkus des Fudji gehalten habe.

Naumann.	Harada.
Wo sich longitudinale und transversale Spalten schneiden, muſs die Vulkanität am gröſsten sein.	Die intensive Vulkanität, wie sie sich um den Asama und Yakeyama kundgibt, hat wahrscheinlich ihre Ursache in dem Vorhandensein eines Spaltensystems, an welchem die nordjapanische Innenseite am Ostfuſs des Hidagebirges in die Tiefe gebrochen ist.
Die Zerstückelung der Binnenmeerzone hat, wie die wahrscheinlich pliocänen Brecciendecken der Gegend von Shozushima beweisen, in sehr junger Zeit stattgefunden. Das bruchstückweise Absinken kann als ein wesentliches Merkmal des mittleren der drei Streifen, in die sich das südliche Japan nach dem geologischen Bau gliedert, hingenommen werden[1].	Nicht in der Fudjizone, sondern in dem dem Binnenmeere entsprechenden Streifen hätten wir es mit einem ausgezeichneten Typus der Grabensenkung zu thun[2]. Die sehr mächtigen, groſse Andesitblöcke enthaltenden tertiären Breccienschichten, welche auf Shodoshima und bei Yashima und am Gokensan auf Shikoku in ziemlich gleicher Höhe auf dem Granitsockel ruhend sich als Reste einer zusammenhängenden Tafel erwiesen, und die starke Beeinflussung der Tertiärschichten der Senkungszone durch dislocierende Bewegungen gegenüber der im allgemeinen ruhigen Lagerung der gleichalterigen Gebilde an der Nordseite von Shikoku sprechen für das jugendliche Alter der Grabensenkung des Setouchi[2].

Aus der vorgeführten Zusammenstellung ist ersichtlich, daſs nicht gerade selten eine sehr weitgehende Übereinstimmung in unsern Darlegungen hervortritt. Im Falle derartiger Übereinstimmungen fehlt es jedoch an einer Bezugnahme auf meine vorgängigen Publikationen Ich könnte die Zusammenstellung noch weiter führen, um auf derartige Verwandtschaften hinzuweisen. Doch soll es ja hier hauptsächlich auf die Präzision der Differenzen ankommen. Ich würde mich freuen, wenn es mir gelungen sein sollte, diesen Zweck zu erreichen, ganz besonders eine kritische Betrachtung der sogenannten „Fujizone“ in den Kreisen meiner frühern Mitarbeiter und in japanischen Kreisen überhaupt anzuregen. Unsre Bestrebungen haben ja ein und dasselbe Ziel vor Augen: die Wahrheit.

Versuchen wir es jetzt, die Grenzen der Fossa magna zunächst lediglich nach geologischen Gesichtspunkten näher zu bestimmen. Von Shizuoka zieht eine gangartige Eruptivmauer nach Norden bis zum Anfang der Misaka-Stufe. Die Westgrenze des Ganges sowohl wie die Westgrenze des grünen Streifens der geologischen Übersichtskarte der II. Sektion bezeichnet auch die Westgrenze der Fossa. Auch der Komagatake-Granitstock würde als Eruptivgebilde noch zur Fossa zu rechnen sein. Nun biegt die Richtung der Randlinie nach Nordwesten um und folgt dem Miyagawa bis zum Suwako. Die hier angehäuften vulkanischen Eruptionsprodukte gehören soweit zur Fossa, als sie nach Süden ausgreifen. Weiterhin hätten wir die ganze Ebene von Matsumoto als ein Glied der Hohlgasse zu bezeichnen. Ein erneutes Umbiegen, diesmal aus Nordwest nach Nord, ist schon durch die westliche Umrandung genannter Ebene angedeutet. Der Fuſs des Hidagebirges bis zur Himegawamündung läſst dann den plötzlichen Abbruch des Südflügels bis zum Japanischen Meer auf das deutlichste erkennen. Wenn man die beschriebene Linie auf den Karten verfolgt, so wird man erkennen, daſs ihr Verlauf ein keineswegs regelmäſsiger ist. Sie läſst nämlich vorerst ein zweimaliges, wenn auch flaches Umbiegen hervortreten, und dann beschreibt sie im Detail ziemlich komplizierte Ausbuchtungen. Nichtsdestoweniger prägt sich orographisch eine Reihe von Tiefenlinien aus, welche den allgemeinen Verlauf der Grenzlinie auf dieser Seite recht deutlich machen. Es sind dies die Tiefenlinien des Fujikawa, des Miyagawa und des Himegawa. Auch der plötzliche Abbruch der groſsen Faltenzüge, welche aus West und Süd heranziehen, markiert sich sehr deutlich längs einer

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[1] Ich habe, wie schon oben bemerkt, nie behauptet, daſs in der Fossa magna eine Grabensenkung vorliege, sondern habe die quere Depression der Zersprengung einfach mit dem Namen Fossa magna belegt.

[2] Ich beanstande die Bezeichnung des Setouchi als Grabensenkung. Eine Grabensenkung ist ein zwischen zwei Parallelklüften hinziehendes, gesenktes, streifenförmiges Stück der Erdkruste. Der Setouchistreifen ist dagegen eine Trümmerzone, in der die Zerstörung längs einer Mittellinie am stärksten hervorzutreten scheint. Die Begrenzung dieser Trümmerzone nach auſsen ist scharf, geradlinig, während sie nach innen ganz unregelmäſsig erscheint.

Parallelen zu den bezeichneten Tiefenlinien. Die Fossa magna läſst sich überhaupt geologisch und topographisch abgrenzen. Der letztere Weg ergibt ein einfacheres Resultat und ist, da die Einteilung eines Gebirges nie eine rein geologische, sondern immer eine geographisch-geologische sein sollte, vorzuziehen. Ich befinde mich mit Harada vollkommen in Einklang, wenn er die Fossa als eine groſse, an Einbrüchen und vulkanischen Ausbrüchen reiche Störungsregion (den Ausdruck „Zone“ vermeide ich absichtlich) ansieht. Mit der Zersprengung, wie ich sie von Anfang an vertreten habe, sind eben Eruptionen und Einbrüche notwendig verbunden gewesen. Solche Phänomene sind für die Fossa in eminenter Weise charakteristisch, und wo ihre Spuren an den Rändern auftreten, da liefern diese, falls es sich immer noch um die geologische Abgrenzung handelt, den erwünschten Anhalt. Streng genommen würde freilich zu berücksichtigen sein, daſs die vulkanischen Ergüsse von den Spaltenwegen aus seitlich übergeflossen sind. Die Überflieſsungen müſsten noch zur Spalte, also zur Fossa gerechnet werden; die eigentliche Grenze der Fossa aber wäre streng genommen die Auſsenkluft der Spalte.

Schwieriger als auf der Westseite liegen die Verhältnisse im Osten. Hier begegnen wir zunächst neben dem Fudji einem von Misaka-Ablagerungen konzentrisch umrandeten Stock von Dioriten. Der grüne Hof wird wieder von einem Kreis vulkanischer Tuffe umschlossen. Im Norden bezeichnet dann der Katsuragawa die ungefähre Grenze gegen die Ablagerungen des Berglandes von Quanto. Durch den bogenförmigen Abbruch der ältern Schichten des Kobotoke gegen die jugendlichen Tuffe und die kreisförmige Umrandung des Dioritkerne ist es augenscheinlich, daſs wir hier einen Kesselbruch vor uns haben. Solcher Kesselbrüche sind in der Nachbarschaft noch mehrere vorhanden. Ihre Ränder bezeichnen die Grenzen der Fossa gegen das Bergland von Quanto. Auf diese Weise entstehen groſse Ausbuchtungen. Eine schmale Halbinsel schiebt das Bergland von Quanto zwischen der Jazugatakekette und dem Kokuchi-Kimpustock aus Nordost in die Fossa herein. Nicht weniger merkwürdig als dieser zungenförmige Vorsprung des Nordflügels, welcher eine sehr enge Zusammenschnürung der Fossa bedingt, erscheint jene von Dioriten an der östlichen Umrandung des Kofubeckens umklammerte Ruine alter Grauwacken und Schieferberge. Alle derartige in hohem Grade auffälligen Erscheinungen bekunden indessen nur die sehr komplizierte Gestaltung der Spaltenwege. Es wird einleuchten, daſs die Zersprengung des Inselbogens, des ganzen breiten Gebirges nicht in sehr regelmäſsiger Weise vor sich gehen konnte, daſs die Hauptspalte sekundäre Risse im Gefolge haben muſste, und daſs das Auftauchen einer übrigens etwas seitwärts gerückten Ruine des alten Gebirges in der Fossa nicht dazu angethan ist, die hier vertretene Ansicht, die transversale Terrainsenke, welche im Scheitel des Japanischen Bogens auftritt, müsse als eine sehr alte, durch die Bewegung des Shichitogebirges erzeugte Auseinanderreiſsung betrachtet werden, zu nichte zu machen.

Nordwestlich von der Einschnürung wächst über der Mittellinie der Fossa eine sehr regelmäſsig gebildete Kette hoher vulkanischer Gipfel auf. Es sind dies die Gipfel vom Yatsugatake bis zum Tateshina. Die Kammlinie der hochwichtigen jungen Eruptivauftürmung fällt genau mit der Mittellinie der Fossa zusammen, und es erscheint überhaupt beachtenswert, daſs fast überall dort, wo derartige langgestreckte Ergüsse vulkanischen Materials vorliegen, ihre Achse mit der Fossa magna-Achse zusammenfällt. Die Ostgrenze wird in diesem Teile durch den Oberlauf des Chikumagawa gebildet, und auch weiterhin dürfen wir diesen Fluſs bis in die Gegend von Asano als Grenzfluſs hinnehmen. Von Asano führt jetzt eine Eisenbahn nach Takata zur Mündung des Sekigawa. Der Paſs, den sie in der Nähe des Nojiriko überschreitet, ist nur ca 730 m hoch. Wir betrachten diese Linie als weitere Grenzscheide der Fossa. Westlich von ihr liegt noch der groſse Stock vulkanischer Hochgipfel des Takatsuma, Yakeyama, Akakura &c.

Die eigentliche Bildung, mit der wir es hier zu thun haben, lieſse sich nach v. Richthofen[1]) als Tiefmuldensenke bezeichnen. Was ihre orographische Eigentümlichkeiten betrifft, so fällt zunächst die schmale, gestreckte Form und die Begrenzung durch Steilränder des normalen Gebirges ins Auge. Allerdings könnte dem entgegengehalten werden, daſs der Abbruch auf der Ostseite kein so hochansteigender ist wie im Westen, aber mögen hier die Erhebungen des alten Berglandes von Quanto auch um etwa 1000 m niedriger sein als im Akaishi-Sphenoid, die Massen müssen noch immer sehr bedeutend erscheinen. Auch ist hier ein plötzliches Absinken gegen die Tiefe der Mulde zu konstatieren. Die lange Erstreckung bei geringem Durchmesser (Länge über 200 km, Breite im mittlern Teile, wo die Yatsugatakekette aufsteigt, ca 26 km) und die wenigstens auf lange Strecken hin steilen Wände lassen die Senke im groſsen und ganzen grabenförmig erscheinen. Daher die Bezeichnung Fossa magna.

Geologisch charakterisiert sich die Fossa magna zunächst als eine Lücke des zonalen Faltengebirges. Eine mitten hindurchziehende Kette groſser Vulkanberge mit sehr dicht geschlossener Aneinanderreihung an einigen Stellen verrät einen groſsen Spaltenweg im Schoſse der Lücke. Durch die vulkanischen Überflutungen und Aufschüttungen wird übrigens die Gestalt der Senke in sehr wesentlicher Weise modifiziert. Wir müssen vor allem die Vulkanberge eliminieren, wenn wir uns eine rechte Vorstellung von der Form der Fossa machen wollen. Es ist augenscheinlich, daſs die Mulde bei Weglassung der Vulkane viel tiefer ausfällt. Auch die Auskleidung mit jugendlichen Sedimenten, welche z. B. im obern Abschnitt zwischen Matsumoto und Nagano auftritt, haben wir uns wegzudenken. Groſse kesselförmige Einbrüche mit gewaltigen Eruptivmassen machen sich auf der Seite des Pazifischen Ozeans geltend. Diese Erscheinungen sind als sekundäre aufzufassen und haben gleichfalls beträchtliche Modifikationen in der Gestaltung herbeigeführt.

4. Zur Gebirgsbildung.

Der lange bogenförmige Zug groſser Inseln, welcher von Kiushiu aus über Sachalin bis hinauf zur Amurmündung führt, ist nichts andres als der über das Meer emporragende Teil eines groſsartigen Kettengebirges, eines der gröſsten der Erde. Dieses Gebirge erscheint ebenso groſsartig wie der Himalaya und steht sowohl seinen Bildungsgesetzen wie auch seiner Struktur nach zum vorliegenden Gebiete des Groſsen Ozeans in ganz derselben Beziehung wie das gröſste Gebirge des asiatischen Festlands zur vorderindischen Halbinsel. Während der Himalaya ein Gebiet von 500000 qkm einnimmt, beläuft sich das von den Inseln des japanischen Bogens beanspruchte Areal auf 432000 qkm. Doch gilt ja die letzte Ziffer nur für die oberste Schicht des Gebirges. Würden wir auch den Sockel dazu nehmen, so käme eine Zahl heraus, die das Areal des Himalaya weit überträfe. Die Alpen bedecken ein Gebiet von ca 220000 qkm. Auch der Längenerstreckung nach steht das Japanische Gebirge — der äuſsere Saum von Kiushiu bis hinauf zum Kap Elisabeth miſst nicht weniger als 3200 km — dem Ural und dem Tianschan weit voran. Der äuſsere Saum der Alpen miſst nur 1300 km. Was schlieſslich die vertikale Erhebung betrifft, so gewinnen wir einen Maſsstab durch die Niveaudifferenz zwischen dem tiefsten Abgrunde des Tuskarorobeckens östlich von den Kurilen (8500 m) und der Meereshöhe des höchsten Gipfels im japanischen Archipel, des Fujisan. Diese Niveaudifferenz beträgt nicht weniger als 12280 m, während sich die gröſste Niveauverschiedenheit der Erde überhaupt auf 17340 m beläuft (den höchsten Berg der Erde, den Gaurisankar, zu 8840 m angenommen) und der Betrag der Abplattung auf 21318 m zu veranschlagen ist.

Das Japanische Gebirge gehört zu der von v. Richthofen unterschiedenen Klasse der heteromorphen Faltungsgebirge. Es zeigt nach den Gesetzen seiner Struktur unverkennbare

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[1]) Führer für Forschungsreisende, S. 638.

Verwandtschaft mit dem Himalaya, dem Ural, den Alpen und andern grofsen bogenförmigen Kammgebirgszügen der Erde. Auf der vordern, äufsern oder konvexen Seite liegt eine verfestigte Zone stark gefalteter Sedimente, auf der innern, konkaven oder Rückseite dagegen eine Zone von Trümmern, Ruinen, Schollen, langhinziehenden Spaltenergüssen, Einbruchkesseln und Vulkanen. Nun ist aber der Rückseite das Merkmal der Faltung nicht nur nicht fremd, es treten vielmehr auch hier Stauungen und Quetschungen der Schichten auf, welche kaum weniger intensiv genannt werden können, als die der Aufsenzone. Die Falten der Innenzone sind sogar vielfach nach aufsen überstürzt, eine Erscheinung, die im Südflügel auf das deutlichste wahrgenommen werden kann. Aufserdem beschränkt sich die Faltung auf der Innenseite keineswegs auf die ältern Sedimente; sie hat selbst die jüngsten Ablagerungen ergriffen.

Auf der Westseite der Fossa magna sind die Falten deutlich geschleppt; dagegen tritt auf ihrer Ostseite im Bergland von Kuanto ein so vollkommener Parallelismus mit der Querspalte hervor, dafs man hier eine Pressung von der Fossa aus anzunehmen einige Berechtigung haben dürfte. Im Bergland von Quanto findet jedenfalls nicht das entschiedene Umbiegen in die normale Richtung des Nordflügels statt, wie im Akaishi-Sphenoid die Umbiegung in die Südwestrichtung stattfindet. Die nordwestliche Richtung der Falten im Bergland von Kuanto dürfte also nur zum Teil auf Schleppung zurückzuführen sein. Auffallend sind übrigens die queren Streichrichtungen, welche sich im Nordflügel bis weit hinauf bemerkbar machen. Die grofsen Eruptivmassen, welche sich in der Gegend des Azuma, Shirane &c. angehäuft finden, erklären sich durch die Kreuzung der Longitudinalspalte und der Querspalte, welche gerade dieser Gegend zukommt.

Was nun die Verteilung der tektonischen Vorgänge auf die einzelnen Zeitalter betrifft, so dürfen wir zunächst daran festhalten, dafs schon vor Ablagerung der paläozoischen Schichten intensive Faltungen erfolgt sein müssen. Die kristallinischen Schiefer des Berglandes von Kuanto zeigen andre Lagerungsverhältnisse als die benachbarten Gebilde der paläozoischen Ära. Schon für die ältere Zeit besteht ein ähnliches Verhältnis. Die Gneifse scheinen nämlich vor Bildung der kristallinischen Schiefer Pressungen erlitten zu haben. Dann mufs ich wiederholt auf die abweichende Stellung der Schichten im südlichen Teile des Kuantoberglandes aufmerksam machen. Nach diesen Verhältnissen zu schliefsen, dürften auch in der paläozoischen Zeit Faltungen erfolgt sein. Die ganze Inselkette war jedenfalls schon gegen Schlufs der paläozoischen oder zu Beginn der mesozoischen Ära fertig gebildet, ragte sogar zum grofsen Teil über das Meer empor, wie die Seichtmeerbildungen der Trias-, Jura- und Kreidezeit beweisen. Die Longitudinalspalte ist unzweifelhaft sehr alt. Sie mufs sich schon vor Entstehung der kristallinischen Schiefer gebildet haben und war wahrscheinlich der erste und Hauptanlafs zum Emporwachsen des ganzen Gebirges.

Die Haupteruptionen sind ziemlich spät erfolgt. Ich habe schon früher angegeben, dafs bei weitem die Hauptmasse der an der Oberfläche hervortretenden Granitgesteine, welche nächst den Sedimentärmassen den wichtigsten Anteil am Aufbau der japanischen Gebirge nehmen, erst mit Schlufs der paläozoischen Ära oder mit Beginn der mesozoischen aufgetreten sei. Seitdem ich zu diesem Resultate gedrängt wurde, ist die Kenntnis der mesozoischen Ablagerungen des japanischen Inselkranzes weitergediehen. Nach Harada kam weitaus die gröfsere Hälfte der vortertiären massigen Gesteine erst gegen Ende der mesozoischen Ära zum Ausbruch. Es soll nun auch noch kein Eruptivgestein von triadischem oder jurassischem Alter bekannt sein. Wir dürfen hieraus keineswegs den Schlufs auf ein jugendliches Alter der Longitudinalspalte wagen, denn die jüngern Eruptivgebilde halten sich ja immer wieder an alte Spalten, die jüngern Ergüsse decken die ältern in der Regel zu.

Es möge mir zum Schlufs gestattet sein, einer Theorie Raum zu geben, welche ich aus den Verhältnissen des Japanischen Bogens hergeleitet habe, und welche wenigstens den Vorteil hat, sehr wichtige Gesetze zu erklären. Ich glaube für die Urzeit eine das Annäherungsellipsoid in den Regionen des jetzigen asiatischen Kontinents überragende Kalotte annehmen zu müssen. Ural, Himalaya und japanischen Bogen halte ich für Randbildungen dieser im Laufe der Zeitalter groſsenteils in sich zusammengebrochenen Schwellung des Erdkörpers. Eine kreisförmige, schmale Geosynklinale würde die erste Anlage zur Bildung der Gebirgsbogen vorstellen. Die mit der Tiefe wachsende Streckung der unter dieser Rinne gelegenen Krustenteile löst sich in der Bildung einer Spalte aus. Der Gewölbedruck der Kalotte bedingt das Überquellen der auf der Innenseite der Spalte gelegenen Massen, das Gebirge wächst empor. Auf beiden Seiten der Spalte, innen und auſsen, erfolgt Faltung. Die Massen quellen nach auſsen über, während die nach innen gelegenen Streifen einsinken. Die Ergüsse erfolgen nach der Innenseite und können hier auch durch sekundäre Spalten einen Ausweg finden. Auf diese Weise erklärt sich vielleicht am besten der Gegensatz zwischen der verdichteten, befestigten Auſsenzone und der durch lang hinziehende Ejektionen, durch hohe Vulkanität und durch das Einsinken streifenförmiger Bestandteile charakterisierten Innenzone.

III.

Skizze der Orographie von Japan.

Schon ein flüchtiger Blick auf die dieser Abhandlung beigegebene oroplastische Karte läfst erkennen, dafs sich im Scheitel des grofsen Gebirgsbogens, der sich durch Aneinanderreihung der Inseln Kiushiu, Shikoku, Honshiu, Hokkaido und Sachalin verrät, die Gebirgsmassen am dichtesten zusammendrängen und dafs hier die quer zu den Bogen gestellten Richtungen vorherrschen, während seitlich von dieser Region der Verdichtung die Massen sich auflösen, abschwellen und in ihrer Anordnung an die Längserstreckung des Gebirges gebunden erscheinen. Wir können dieses allem Anschein nach sehr verwickelte Bild nicht verstehen, ohne die Gesetze des geologischen Aufbaues zu Rate zu ziehen. Viel einfacher, viel regelmäfsiger würde uns die Anordnung der Terrainformen entgegentreten, wenn wir im stande wären, eine Entblöfsung des ganzen Gebirges von vulkanischen Aufschüttungen, Überflutungen und Spaltenergüssen vorzunehmen. Vulkanische Kegel, Dome, Kuppengebirge und Ketten tragen in sehr hohem Mafse dazu bei, die Gestalt der Oberfläche zu komplizieren, obwohl es gerade diese Komplikationen sind, durch welche der japanischen Gebirgsplastik ein ganz eigenartiger Reiz verliehen wird. Das Eingreifen der vulkanischen Bildungen bedingt einen äufserst anziehenden Wechsel des Formencharakters. Den Ruf landschaftlicher Schönheit würde die japanische Inselkette in weitaus geringerm Mafse verdienen, wenn sie der stolzen Vulkanriesen mit ihren rauchenden Schornsteinen, der grofsartigen, graziös geformten Kegel, der sägeförmig gezackten Felsmauern entbehren müfste. Es ist wahr, dafs unsre Alpen in ihren silberblinkenden Gletscherströmen einen Reiz besitzen, der dem Japanischen Gebirge abgeht; aber dafür entschädigt das letztere sowohl durch die Üppigkeit der Vegetation und die Meerumschliefsung wie auch durch die Vulkannatur weitausgedehnter Gebirgsteile. Die vulkanischen Erhebungen zeigen übrigens, mit Ausnahme der Aufschüttungskegel, ziemlich viel Waldbestand. Zuweilen — nicht in der Regel — kommt bei den Vulkanen eine gürtelförmige, scharf abgegrenzte Gliederung der Vegetationsgebiete vor. Einen solchen Fall vermochte ich am Nordabhang des Chokai nachzuweisen, wo ein prächtiger Wald von Buchen um den Berg herumzieht[1]).

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[1]) Dieser Wald ist von kolossaler Ausdehnung, der gröfste gleichmäfsig zusammengesetzte Wald, den ich in Japan gesehen habe. Sonst ist ja, wenigstens bei den Laubholzwäldern, die Mischung sehr zahlreicher Arten charakteristisch. Bei sehr gleichmäfsigem Bestande dehnt sich der Waldgürtel des Chokai auf 9 km in querer Richtung aus. Eine sehr grofse Anzahl der Stämme ist förmlich überwuchert mit nufs- bis apfelgrofsen, gallartigen Auswüchsen. Unterhalb des Waldes folgt Hara. Ich möchte hier bezüglich der japanischen Vegetationszonen auf einige hochinteressante Arbeiten aufmerksam machen, welche neuerdings erschienen sind: Tanaka, Dai Nippon Shokubutsu Tai Chosu Hokoku, Bericht hierüber von Yokoyama in Petermanns Mitteilungen 1887, und Fesca, Beiträge zur Kenntnis der japanischen Landwirtschaft, Berlin 1890; vgl. auch Rein, Japan, Bd. I, S. 153 und Band II, S. 262.

Tanaka unterscheidet folgende Zonen:

1. Zone der Ficus Wightiana Wall.
2. „ „ Pinus Thunbergii Pabst.
3. „ „ Fagus sylvatica Linné.
4. „ „ Abies Veitchii Henk und Höchst.
5. „ „ Pinus Cembra Linné.

Es ist nun interessant, zu sehen, wie sich die verschiedenen Pflanzengürtel nach Süden zu immer höher ansteigend um das ganze Gebirge herumziehen, so dafs sich das Verhältnis zum Gebirge durch eine Reihe übereinandergetürmter Schichten darstellen liefse, welche die Oberfläche schneiden. Die Durchschnittslinien der flach nach Norden einfallenden Schichtenflächen mit dem Gebirge würden nichts andres zu bedeuten haben als die Grenzen der Vegetationszonen.

Den wichtigsten Anteil am Aufbau des Japanischen Gebirges nehmen kristallinische Schiefer und Sedimente der paläozoischen Ära. Das Auftreten ihrer zu mächtigen Falten gestauten Schichten bedingt einen eigentümlichen Oberflächentypus, den ich schon früher durch die Bezeichnung „Altes Bergland" zu kennzeichnen versucht habe. Die Thäler sind meist quer oder ganz unregelmäfsig gestellt, nur in vereinzelten Fällen treten Längsthäler auf. Die Einschnitte des Wassers beteiligen sich also nur in sehr untergeordneter Weise an der Gliederung. Die Rücken sind eng zusammengedrängt und lassen nur Platz für finstere, felsige Schluchten, durch welche das Wasser auf mäandrisch gewundenen Wegen den Abflufs zur Küste sucht. Es kommt nicht zur Bildung scharfer Kämme; auch Gipfel, die das Durchschnittsniveau der Pässe hoch überragten, kommen nicht vor, und die höchsten Emporragungen sind nicht viel in ihrer Erhebung über das Meer verschieden, sobald sie benachbart liegen. Ein dichtes Waldkleid überzieht in der Regel die breiten Rücken und sucht auch an den steilen Thalwänden Halt. Das Alte Bergland bietet der Vegetation einen sehr günstigen Boden. Es kommt hie und da zur Bildung sehr stattlicher Mischwälder. Ausnahmsweise traten auch Waldungen auf, welche sich aus Bäumen nur einer Art zusammensetzen, wie auf der Halbinsel Kii, nicht weit vom Koyasan, wo die stolze Maki (Potocarpus macrophylla), ein sonst seltener Baum, über weite Erstreckung hin herrscht.

Die echten Querthäler des Alten Berglandes sind wildromantisch, so das Thal des Miyakogawa im Norden (Provinz Rikuchiu), die Quellverzweigungen des Aragawa (Kuanto), das Thal des Kumanogawa auf Kii, der Querdurchbruch des Yoshinogawa auf Shikok und des Miotogawa auf derselben Insel. Wer an den Naturschönheiten des Landes seine Freude haben will, der mufs diese Schluchten mit ihren brausenden Wassern, smaragdfunkelnden Felsgrotten, mit ihren im Frühling blütenreichen, im Herbst buntfarbigen Waldflecken, mit ihren an die Thalengen angekitteten oder sich in den Weitungen ausbreitenden Dorfanlagen durchwandern.

Das Alte Bergland ist für die Aufsenzone charakteristisch. Treten die Sedimentmassen der vorpaläozoischen Ära auch in andern Teilen des Inselgebiets in nicht unwesentlicher Entwickelung auf, so zeigt sich hier doch der Oberflächentypus, der ihnen ureigentümlich ist, durch das Eingreifen andrer Gebilde gestört und modifiziert. Die kristallinischen Schiefer, welche in andern Gebirgen die hochragendsten Gipfel bilden, sind in Japan, wo sie dieselbe Stellung einnehmen, wo sie wie anderwärts ein Zentralmassiv bilden, an verhältnismäfsig tiefe Niveaus gebunden. Sie steigen jedenfalls im allgemeinen nicht zu so gewaltigen Höhen auf, wie die in enger Nachbarschaft emporragenden paläozoischen Massen (Akaishisphenoid, Kii, Shikoku).

Nächst dem Alten Bergland ist das Granitgebiet in sehr grofser Ausdehnung entwickelt. Die Granite, welche zum grofsen Teile von sehr jugendlichem (jungmesozoischem) Alter sind, bilden vielfach, wie z. B. innerhalb des Nordflügels der Hauptinsel, stolze Berghäupter. Durch zackige Formen sind die Gipfel der granitischen Eruptivmassen ausgezeichnet; doch findet man nicht selten breite, plumpe Rücken. Zuweilen bildet der Granit auch langausgedehnte, manchmal sehr breite Züge, wie z. B. auf Chiugoku. Während die Granitberge des Nordens selbst da, wo sie die charakteristische Neigung zur Felsbildung bekunden, einer Pflanzendecke Stütze bieten, sind die niedrigern Granitschwellen der Inlandsee im Gebiet von Chiugoku und südlich vom Biwa-See in einen Mantel von Zersetzungsgrus gehüllt, so dafs man vielfach den Eindruck bleicher, grofser Sandwälle erhält. Diese entwaldeten Granitregionen bieten das Bild unaufhaltsamer Zerstörung.

Aufser den vulkanischen Gesteinen, alten Schiefern (einschliefslich der Grauwacken, Hornsteine &c.) und Graniten wären noch die vulkanischen Tuffe als Bildungen zu nennen, welche ihrer weiten Verbreitung zufolge für die Beurteilung der Oberflächenverhältnisse sehr wichtig erscheinen müssen. Sie decken im Nordflügel der Hauptinsel die ältern Bildungen auf weite Strecken hin zu und erreichen merkwürdigerweise Niveaus von sehr beträchtlicher Meereserhebung. Sie bilden breite Hügelgruppen und ziehen über Pässe weg, welche nahezu 1000 m Höhe erreichen. Die vulkanischen Tuffe bilden Tafeln oder sanft gerundete Rücken. Sie sind vielfach sehr unfruchtbar und tragen besonders im äufsersten Norden der Hauptinsel nur lockere Bestände. Die tertiären Vorkommnisse können, so lange es sich nur um Beurteilung der Oberflächengestaltung handelt, mit den vulkanischen Tuffen in eine Kategorie gestellt werden. Ihres lokalen Vorkommens wegen und auch deshalb, weil sie sich ausschliefslich an niedrigere Niveaus halten, sind sie von geringerer Bedeutung.

Um einen ungefähren Begriff von den Höhenverhältnissen der vornehmsten Gipfel zu geben, habe ich in folgender Tabelle eine Reihe von Berghöhen unter Angabe der geologischen Natur zusammengestellt.

Namen der Gipfel.	Geologische Beschaffenheit.	Kori (Bezirk).	Kuni (Provinz).	Höhe in m.
Fujinoyama.	Vulkan.	Suntogori.	Suruga.	3780
Shiranesan.	Paläozoisch.	Komagori.	Kai.	3094
Akaishiyama.	„	Inagori.	Shinano.	3093
Komagatake.	Granit.	Komagori.	Kai.	3001
Ontake.	Vulkan.	Chikumagori.	Shinano.	2993
Norikuradake.	„	Chikumagori. Masudagori.	Shinano. Hida.	2992
Rengeyama.	„	Azumigori.	Shinano.	2990
Yatsugadake.	„	Komagori.	Kai.	2932
Tateyama.	Diorit.	Niikawagori.	Echiu.	2848
Jizōdake.	Granit u. Paläozoisch.	Komagori.	Kai.	2796
Hakusan.	Vulkan.	Nomigori.	Kaga.	2687
Kimpuzan.	Granit.	Komagori.	Kai.	2551
Tateshinayama.	Vulkan.	Sakugori.	Shinano.	2530
Iwasugesan.	„	Takaigori.	„	2515
Asamayama.	„	Sakugori.	„	2480
Miokōzan.	„	Kubikigori.	Echigo.	2464
Nantaisan.	„	Tsugagori.	Shimozuka.	2453
Yakeyama.	„	Kubikigori.	Echigo.	2410
Komagatake.	Paläozoisch.	Inagori. Chikumagori.	Shinano	2366
Azumayama.	Vulkan.	Takaigori.	„	2357
Ishizuchisan.	„ ?	Sufurgori. Tosagori.	Iyo. Tosa.	2355
Akanagisan.	„	Tsugagori.	Shimozuke.	2290
Shiranesan.	„	„	„	2286
Shiranesan.	„	Takaigori. Agatsumagori.	Shinano. Kozuka.	2253
Tsurugiyama.	Paläozoisch.	Makagori. Mimagori.	Awa.	2241
Enasan.	Granit.	Enagori.	Mino.	2240
Kodake.	—	Takaigori.	—	2201
Chiokaizan.	Vulkan.	Jurigori. Akumigori.	Ugo. Uzen.	2156
Naebasan.	„	Uwonumagori.	Echigo.	2155
Otsukiyama.	Granit.	„	„	2155
Kuroyebohidake.	Paläozoisch.	Haibaragori Suchigori.	Totomi.	2148
Ichifusayama.	„	Kumagori. Morakatagori.	Grenze Higo. Hiuga.	2139
Iidesan.	Granit.	—	Grenze Echigo. Iwashiro. Uzen.	2136
Kurohimeyama.	Vulkan.	Minochigori.	Shinano.	2095
Bakushidake.	Granit.	Morokatagori.	Hiuga.	2081
Hotakasan.	Vulkan.	Tonegori.	Kozuke.	2074
Komagatake.	Granit.	Aizugori.	Iwashiro	2064
Ganjusan.	Vulkan.	Iwategori.	Rikuchiu.	2050
Kurodake.	„	Naorigori.	Bungo.	2036
Kumotoriyama.	Paläozoisch.	Chichibugori.	Musashi.	2001
Hayachinesan.	„	Naka Heigori Nishi Heigori	Rikuchiu.	2000
Komanagosan.	Vulkan.	Tsugagori.	Shimozuke.	2000
Kasadake.	„	Takaigori.	Shinano.	2000
Gdassan.	„	Tasawagori. Murayamagori.	Uzen.	1990

Namen der Gipfel.	Geologische Beschaffenheit.	Kori (Bezirk).	Kuni (Provinz).	Höhe in m.
Hiuchisan.	Vulkan.	Aizugori.	Iwashiro.	1960
Azumayama.	"	Okitamagori. Shinobugori.	Uzen. Iwashiro.	1973
Waribikiyama.	Diorit.	Uwonumagori.	Echigo.	1960
Asahiyama.	"	"	"	1958
Akayasanyama.	Vulkan.	—	Grenze Iwashiro. Kozuke. Shimosuke.	1937
Dainichidake.	Granit.	Kambaragori. Yamagori.	Echigo. Iwashiro	1930
Asahiyama.	"	Tagawagori. Murayamagori.	Uzen.	1921
Oborayama.	Paläozoisch.	Chichibugori.	Musashi.	1913
Nasuyama.	Vulkan.	Nasugori.	Shimozuke.	1912
Karusawayama.	Diorit.	Uwonumagori.	Echigo.	1903
Yabureyama.	—	Chikumagori.	Shinano.	1900
Akagisan.	Vulkan.	Setagori.	Kozuke.	1893
Asodake.	"	Asogori.	Higo	1890
Ominesanjōyama.	Paläozoisch.	Yoshinogori.	Yamato.	1882
Yatsukōdayama.	Vulkan.	Tsugarugori. Kami Kitagori.	Mutsu.	1852
Hakkaizan.	Diorit.	Uwonumagori.	Echigo.	1850
Okaguradake.	Vulkan.	Tsugarugori. Kitagori.	Mutsu.	1840
Bandaisan.	"	Yamagori.	Iwashiro.	1840
Niudōyama.	—	Uwonumagori.	Echigo.	1824
Dainichidake.	Paläozoisch.	—	Grenze Echizen. Mino. Hida.	1808
Takaharayama.	Vulkan.	Shioyagori.	Shimosuke.	1793
Itouyama.	Granit.	Tagawagori. Iwafunegori.	Uzen. Echigo.	1780
Sobogadake.	Paläozoisch.	Usukigori.	Hiuga.	1770
Gandōyama.	Vulkan.	Shibatagori. Murayamagori.	Rikuzen Uzen.	1740
Nekodake.	"	Asogori.	Higo.	1660
Daisen.	"	Himogori. Yabusegori.	Hōki.	1640
Komagadaka.	"	Wagagori. Isawagori.	Rikuchiu.	1638
Odaigaharayama.	Paläozoisch.	Takegori. Yoshinogori.	Ise. Yamato.	1636
Asakusayama.	Vulkan.	Uwonumagori.	Echigo.	1621
Yufudake.	"	Hayamigori.	Bungo.	1600
Iwakisan.	"	Tsugarugori.	Mutsu.	1594
Komagotake.	"	Okachigori. Kuribaragori.	Ugo. Rikuzen.	1569
Tanzawayama.	Misakastufe?	Aikōgori.	Sagami.	1569
Shiragamiyama.	Paläozoisch.	Kanragori.	Kozuke.	1511
Komagadake.	Vulkan.	Kubikigori.	Echigo.	1501
Wagadake.	Granit.	Wagagori. Senbokugori.	Rikuchiu. Ugo.	1485
Kirishimayama.	Vulkan.	Morokatagori.	Hiuga.	1469
Moriyoshisan.	"	Akitagori.	Ugo.	1457
Onsendake.	"	Takakugori.	Hizen.	1424
Tsurumiyama.	"	Hayamigori.	Bungo.	1400
Amagisan.	"	Tagatagori.	Izu.	1388
Ashitakayama.	"	Suntōgori.	Suruga.	1233
Taiheisan.	Granit.	Akitagori.	Ugo.	1090

Aus der Tabelle ist zu ersehen, daſs die Vulkane im allgemeinen das Gebirge hoch überragen. In zweiter Linie rangieren die Gipfel des alten Berglandes der Auſsenseite. Wir haben aber hier zu berücksichtigen, daſs die höchsten Spitzen des Alten Berglandes dem Akaishisphenoid angehören, also einem Gebirgsklotze, der eigentlich keine ganz normalen Verhältnisse zeigt. Hier sind die Falten auf einen sehr engen Raum zusammengedrängt, wie es sonst nirgends in der ganzen Inselkette der Fall ist. Demnach sollten eigentlich die Granitgipfel als nächst den vulkanischen im allgemeinen am höchsten aufragend bezeichnet werden. Auch anderweitige ältere Eruptivgesteine können so bedeutende Niveaus erreichen.

Was die Küstengliederung der vier groſsen Inseln betrifft, so tritt zwischen der kontinentalen und der ozeanischen Seite des ganzen Bogens ein sehr augenfälliger Gegensatz hervor. Die letztere zeigt nämlich viel zahlreichere Buchten und Vorgebirge. Sie ist viel reicher gegliedert. Harada[1]) führt, um diese Gegensätze zu charakterisieren, die Zahlen der Ino'schen Küstenaufnahme an, welche zu Anfang dieses Jahrhunderts ausgeführt worden ist. Nach diesen Aufnahmen beträgt die Küstenlänge auf der ozeanischen Seite 3507 japanische Ri, auf der kontinentalen nur 1155 (1 japan. Ri = 3,2307 km). Es wäre also die Gliederung auf der pazifischen Seite mehr als doppelt so groſs wie auf der Seite des Japanischen Meeres. Die Zahlen sind indessen keineswegs zutreffend, da die Umrandung des Binnenmeeres, der sogenannten Inland-Sea, in das ganze Gebirge hineinfällt und keineswegs bei Beurteilung der Umgrenzung desselben durch das Meer in Betracht kommen kann. Wir haben streng zu unterscheiden zwischen Innenrand und Auſsenrand des Bogens. Die Trümmerzone der Inland-Sea liegt im Schoſse der Kordillere. Ebensowenig wie die südliche Küstenlinie von Chiugoku und die nördliche Küstenlinie von Shikoku bei einer Berechnung, wie die vorgeführte, in Betracht gezogen werden sollte, kann die Gesamtumschlieſsung von Kiushiu zu der ozeanischen Seite gerechnet werden.

In dem Umrisse der Insel Shikoku sowohl wie der Halbinsel Kii gibt sich das Durchgreifen des Zentralmassivs zu erkennen. Der quere Abbruch streichender Bergrücken gegen das Meer führt in der Bungostraſse und am Ostflügel von Kii zur Bildung von Riasküsten. Der Südflügel des Bogens zeigt auf der Auſsenseite groſse bogenförmige Ausschnitte, die auf ausgedehnte Senkungsfelder hinweisen. Solche Ausschnitte fehlen im Nordflügel. Vielleicht weist dieser Gegensatz darauf hin, daſs im Gebiete des Riukiubogens (zwischen den Riukiu und Shichito) Auseinanderzerrungen stattgefunden haben, als Folge der Bewegungen in der Shichitokette. Das Durchgreifen der Zonen gibt sich in der Form von Yezo (Hokkaido) ebensowohl zu erkennen wie in der Gestaltung der Insel Kiushiu[2]).

Fassen wir nun, um den Zuschnitt des Gebirges beurteilen zu können, die Hohlformen des Terrains ins Auge, so ist zunächst auf die Trümmerzone des Setouchi, des Binnenmeeres, aufmerksam zu machen. Dieselbe hat die Form einer flachen, mit zahlreichen, auſserordentlich unregelmäſsig begrenzten, stellenweise sehr dicht gedrängt stehenden Erhebungen besetzten Mulde. Die seitliche Begrenzung dieser Depression, welche sich von Shimonoseki bis Amagasaki und darüber hinaus auf 400 km Länge verfolgen läſst, ist sehr unregelmäſsig.

Bei Elimination der Vulkane fällt eine zweite groſse Hohlform auf, nämlich die quergestellte über 200 km lange Depression der Fossa magna. Sie ist mit groſsen Vulkanbergen besetzt, läſst aber noch jetzt eine quer über den ganzen Inselbogen ziehende, durch Thalwege markierte Tiefenlinie erkennen. Meeresdurchbrechungen liegen in der Straſse von Bungo und in der Straſse von Shimonoseki vor, während eine weitere quergestellte Depression vom Yodogawa durch den Biwasee über den Todogutsetoge nach Tsuruga zieht.

Das Japanische Gebirge hat sehr schöne Längsthalbildungen aufzuweisen. Hohlformen dieser Art beobachten wir in groſser Regelmäſsigkeit am Innenrande des Zentralmassivs. Sie bezeichnen vielfach die Grenze zwischen Auſsen- und Innenzone. Von Nord nach Süd haben wir folgende Längsthäler zu nennen: Mabechigawa, Kitakamigawa, Abukumagawa, Tenriugawa[3]) zum Teil, Kushidagawa und Miyagawa, Kiinogawa, Yoshinogawa[4]). Auſser den

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[1]) Die japanischen Inseln, S. 5.

[2]) Eine ausführliche Beschreibung der Küstengestaltung findet sich in der angeführten Schrift Haradas, S. 1—25.

[3]) Der Tenriugawa durchbricht im untern Teile seines Laufes das Gebirge in querer Richtung.

[4]) Der Yoshinogawa besteht aus drei Abteilungen. Der Unterlauf zieht in der Provinz Awa auf der Innengrenze des Zentralmassivs zwischen kristallinischen Schiefern und einem mesozoischen Rücken hin, im Mittellaufe bildet er einen engen Querdurchbruch durch den Streifen der kristallinischen Schiefer und wird dann wieder an der Auſsenseite des Zentralmassivs zwischen kristallinischen Schiefern und paläozoischem Gebiet zum Längsthal.

Genannten sind noch Kisogawa zum Teil, Aritagawa und Itakagawa (auf Kii), Nakagawa (Shikok, Awa) als untergeordnete Längsthalbildungen zu bezeichnen. Das Gebirge ist im übrigen reich an Querthälern. Eigentümlich sind die mehr oder weniger knieförmigen Fluſsläufe im Norden von Honshiu, welche, im allgemeinen einer nordwestlichen Richtung folgend, dem Winkel einer westwärts gerichteten Abzweigung von der Hauptkette entspringen, um dem Japanischen Meere zuzuströmen: der Iwakigawa, der Noshirogawa und der Mogamigawa. Aganogawa und Shinanogawa zeigen schon abweichende Verhältnisse.

Die Inseln Kiushiu und Hokkaido zeigen in bezug auf Stellung sowohl wie Gestaltung viel Analogie. Auch was den Zuschnitt des ganzen Gebirges nach den Erosionswegen betrifft, gibt sich eine Verwandtschaft kund. Die Fluſsläufe halten sich nämlich auf beiden Inseln an einen Verlauf, der wenig oder gar keine Gesetzmäſsigkeit zu verraten scheint. In keinem der beiden Gebiete sind deutlich entwickelte Längsthäler vorhanden. Die Schuld an diesen Verhältnissen trägt offenbar einmal die geringe Ausdehnung der Inseln in der Längsrichtung und dann das eigentliche Eingreifen der vulkanischen Bildungen.

Die Hauptwasserscheide verläuft auf Yezo vom Kap Soyazaki in gekrümmter Linie bis Erimozaki der Richtung NNW—SSO folgend[1]). Diese Wasserscheide entspricht der Wasserscheide des Kitakamigebirges. Yezo stellt eben ein sehr weit gegen den Ozean hinausgeschobenes Stück des ganzen Gebirges dar.

Die Wasserscheide der Hauptinsel Honshiu hat in dem Nordflügel erst einen ziemlich gleichmäſsigen Verlauf. Sie folgt vorerst dem Rücken einer sehr regelmäſsig ausgebildeten, mit Vulkanen gespickten Kette, welche ich schon früher als Meridiankette des Nordens bezeichnet habe. Südlich von Aizu biegt aber die Wasserscheide nach SW um, folgt dem Vulkankranze des Shirane, Azuma und Asama und beschreibt nun hier eine sehr merkwürdige Ausbuchtung nach dem Ozean zu. Sie geht südwestlich vom Suwasee über den Toriitoge, steigt im Zickzack zum Norikura auf und verläuft nun, von kurzen Brechungen und Buchtungen abgesehen, ziemlich gleichmäſsig bis zur westlichen Endung von Chiugoku, die Mitte dieser groſsen lappenförmigen Halbinsel durchziehend. Die auffälligste Erscheinung im Verlaufe dieser langen Wasserscheide ist nun die erwähnte Ausbuchtung. Die Bildung ist aber nicht nur auffällig, sondern auch in hohem Grade interessant, weil sie dorthin fällt, wo die Fossa magna quer über den Inselbogen zieht. Man könnte diese Region der Störung des normalen Baues der Gebirge als einen Knoten bezeichnen, von dem aus die Wasserfäden nach allen Richtungen hin ausstrahlen.

Eine Betrachtung der Wasserscheiden innerhalb der einzelnen Gebirgsabschnitte führt zu keinem sehr befriedigenden Resultat. Wer in dieser Beziehung Studien machen will, der kann nicht besser thun, als eine mit der alten Provinzeinteilung versehene Karte zur Hand zu nehmen. Sind doch die Provinzgrenzen immer solche Linien, die in der Natur vorgeschrieben sind. Sie folgen, soweit es irgend angeht, den Bergrücken. Auch die Kerneinteilung richtet sich nach der Gebirgsbeschaffenheit. Es erübrigt zu erwähnen, daſs die

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[1]) Eine neuere Darstellung der Geologie von Hokkaido verdanken wir Jimbo (Explanatory Text to the geological map of Hokkaido. Satporo 1890 und: General Geological Sketch of Hokkaido with special reference to the Petrography. Satporo 1892). Unsere Kenntnisse über die bisher leider sehr vernachlässigte Insel sind durch die Untersuchungen Jimbos in hohem Maſse erweitert worden, besonders ist gegen die Lymanschen „Surveys“ ein anerkennungswerter Fortschritt zu verzeichnen. Es wäre aber zu wünschen, daſs die Begehung der Insel sich auch in die wildern Teile der Gebirgsregion ausdehnte, welche als Hidakakette und nordöstliche Kette zu bezeichnen wären. Auch die nähere Untersuchung der Gebirgsteile, welche zwischen Nutapkaushipe und Shiretokozaki aufgetürmt liegen, wäre dazu angethan, die tektonischen Verhältnisse Yezos, welche jetzt immer noch in vielfacher Beziehung unaufgeklärt sind, zu enthüllen. Es erscheint nichts weniger als zweifellos, daſs die vulkanischen Gesteine so groſse Strecken des Inlandgebiets von Yezo in Anspruch nehmen, wie es die Karten zeigen. Dem alten Bergland wird doch schlieſslich eine gröſsere Ausdehnung zukommen. Nach Jimbos Angaben steigen die zwischen Satporo und Oshamambe gelegenen vulkanischen Massen zu folgenden Höhen an: Makkarinupuri (6440 F.), Iwanobori (3374 F.), Usu (ungefähr 1868 F.), Tarumai (2830 F.). Hakkadake und Esan (1914 F.) und Komadake (4000 F.). Nutabkaushipe wird zu 7500 F. und Meakan zu 4790 F. angegeben. Leider vermiſst man die Angabe, um was für Fuſs es sich handelt, wahrscheinlich jedoch liegt nicht der japanische Shaku, sondern der englische Fuſs vor.

Wasserscheide des Kitakami-Berglands nach der Westseite hin drängt. In einem Falle allerdings, im Falle des Sarukaishikawa, greift sie weit nach Osten aus. Auch im Abukuma-Bergland ist der Abfall nach der Innenseite etwas steiler. Das Gleiche gilt vom Kii- und Shikoku-Bergland. Weil sich auf Kiushiu eine Wasserscheide verfolgen läſst, welche vom Kap Chichakof durch die Mitte der Insel nach Norden bis zur Straſse von Shimonoseki läuft, hat man für diesen Teil des Bogens ein Meridiangebirge anzunehmen beliebt, aber durchaus ungerechtfertigterweise. Das alte Bergland greift, wie ich schon betont habe, durch, und das vom Azo eingenommene Gebiet ist nichts andres als eine Fortsetzung der Setouchi-Trümmerzone. Auch bei Yezo fragt es sich noch sehr, ob eine „Mountain-range of the Chishima-Zone“, wie sie von Jimbo angenommen wird, thatsächlich vorhanden ist.

Harada hat eine tektonische Gliederung des japanischen Gebirges vorgenommen, welche sich von meinen frühern Ausführungen nur dadurch unterscheidet, daſs sie mehr ins Detail geht. Daſs die Aufstellung einer Fujizone der Berechtigung entbehrt, habe ich schon an andrer Stelle dargelegt. Will man ferner den Ausdruck „Scharungsbogen“ in die Terminologie einführen, so muſs jedenfalls erst bewiesen werden, ob eine Scharung in der That statt hat. Ferner kann ich mich nicht zur Existenz einer Dewakette bekennen, welche die Gebirge Yatate, Taiheesan, Asashi und Nippon-Daira umfassen soll. Eine solche Kette gibt es nicht. Die einzelnen Glieder sind durch tiefe und weite Einsenkungen voneinander geschieden. Wer diese Teile der Insel bereist hat, wird schwerlich der Ansicht zuneigen, daſs die Thäler des Noshirogawa, Omoigawa &c. nur Durchbrüche durch eine Kette bildeten. Dem Meridiangebirge entwachsen auf der Innenseite astförmige Abzweigungen, und mit diesen Abzweigungen hängen die Vulkane Früchten gleich zusammen. Ich habe die merkwürdigen Erscheinungen, welche am Innenrande des Nordflügels auftreten, als Einbruchskessel gedeutet[1]) und muſs an dieser Auffassung noch jetzt festhalten. Was dann die Plateaubildungen betrifft, welche Harada anführt, nämlich das Aidzu-Plateau und das Mino-Hida-Plateau, so halte ich dafür, daſs diese Benennungen ebensowenig zutreffend sind. Ausgedehnte Gebirgsteile, welche den Namen „Plateau“ verdienten, kommen im ganzen japanischen Bogen nicht vor.

Das Japanische Gebirge wird durch die Fossa magna in zwei der Ausdehnung nach gleichwertige und auch sonst gleich beschaffene Abschnitte geteilt, einen Nordflügel und einen Südflügel. Man könnte die durch die Flüsse Fujikawa und Kamanashigawa, Miyagawa und Himegawa angezeigte Tiefenlinie als Grenzscheide der beiden Abschnitte ansehen. Ein solches Vorgehen müſste aber vom geologischen Gesichtspunkte aus durchaus ungerechtfertigt erscheinen. Die Fossa magna bildet ein neutrales Gebiet, sie ist also auch als Sonderabschnitt des Japanischen Gebirges zu betrachten.

I.

Nordflügel des Japanischen Bogens[2]).

A. Die Auſsenzone.

Die Auſsenzone des Nordflügels besteht aus dem Kitakami-Bergland, dem Abukuma-Bergland, zu welch letzterm vielleicht noch die Tsukuba Berge gerechnet werden können[3]), und dem Bergland von Kuanto. Auſserdem gehören hierher die hügeligen Gelände zweier Halbinseln, welche den Golf von Yeddo einrahmen, und welche wir mit Harada als die Höhenschwellen von Katsuraawa und der Miura-Halbinsel bezeichnen wollen. Die Ebene von Yeddo gehört groſsenteils zur Auſsenzone. Wo die Grenzlinie durch dieses Tiefland verläuft, ist infolge der Verhüllung durch jüngere Ablagerungen nicht festzustellen. Die innere Grenze der nördlichen Bergländer fällt mit der Tiefenlinie der Längsthäler des Nordens zusammen.

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[1]) Abhandlung II, S. 31.

[2]) Ich lasse bei der folgenden Betrachtung Yezo unberücksichtigt, da die Kenntnis dieser Insel noch zu unvollständig erscheint, und kann vorläufig auf Jimbos Unterscheidung einer Chishimakette, einer Hidakakette, einer nordöstlichen Kette und einer Oshimakette verweisen. Zukünftige Untersuchungen dürften jedoch zu einer etwas andern Auffassung der Oberflächenplastik Yezos führen.

[3]) Wenn Harada das Ashiwogebirge noch zur Auſsenzone rechnet, so trifft er hiermit gewiſs nicht das Rechte, denn das Bergland von Kuanto ist ganz so aufgebaut wie das Bergland von Shikok, und wenn wir für letzteres die innere Grenze der Auſsenzone an der Innengrenze der kristallinischen Schiefer annehmen, so

B. Die Innenzone.

Eine ziemlich regelmäſsig ausgebildete, im allgemeinen scharfkantige, mit vielen hochragenden Gipfeln versehene Kette, die mit einer Anzahl gegen das Japanische Meer hinziehenden Abzweigungen versehen ist, zieht vom äuſsersten Norden der Hauptinsel herunter zum See von Inawashiro, wo eine Unterbrechung vorliegt. Die der Mitte des Landes folgende Kette habe ich schon früher Meridiankette des Nordflügels genannt. Harada nennt sie Wasserscheide oder Mutsukette. Durch die astförmigen, gegen die Innenseite gerichteten Abzweigungen werden bogenförmige Depressionen gebildet, welche sich nach dem Japanischen Meer hin öffnen, um die Flüsse austreten zu lassen. Diese Kessel fasse ich, wie schon weiter oben hervorgehoben, noch jetzt als Einbruchskessel auf. Jeder von ihnen ist durch einen Vulkan ausgezeichnet. Nach diesen vulkanischen Gipfeln, welche das Land hoch überragen, unterscheiden wir einen Gassan-Kessel, einen Chiokai-Kessel, einen Moriyoshi-Kessel und einen Iwaki-Kessel.

Die astförmigen Auswüchse der Meridiankette unterscheiden wir als Yatate-Massiv, Taihei-Massiv, Asahi-Massiv und Iide-Massiv[1]. In dem See von Inowashiro bricht die Meridiankette ab, und es verläuft hier eine quere Depression von der Seite des Japanischen Meeres her bis zur Tiefenlinie des Abukumagawa. Die Bodenschwellen, welche den See auf der Ostseite umgrenzen, weisen eine derart bedeutende Einschnürung auf, daſs die Hügel durch einen Tunnel durchbrochen werden konnten und die Wasser des Sees nunmehr nicht allein nach dem Japanischen Meer sondern auch nach dem freien Ozean zu abflieſsen. Im Süden dieser Querdepression liegt ein mächtiger Gebirgsknoten, welcher seine Verzweigungen nach den verschiedensten Richtungen entsendet. Nicht weniger als vier Provinzen treten in dem Knoten zusammen. Der Taishaku-Gebirgsknoten sendet einen Zweig nach N und NO, SO und SW. Der südwestwärts gerichtete Zweig geht über in den sichelförmig gekrümmten Zug der Vulkane Shirane, Azuma und Asama. Südöstlich vom Asama bricht das vulkanische Gebirge wie die ganze Innenzone bei den Bergen Arafune und Ogeta am Rande des Alten Berglandes von Kuanto ab.

2.

Die Fossa magna.

In das Gebiet dieses streifen- und muldenförmigen, quergestellten Abschnitts des Inselbogens fallen das Idzu-Massiv, die Hakone-Berge, der Ashitaka-Stock, der Fuji, der Pseudozirkus des Fuji, der Tanzawa-Stock, das Kokushi-Gebirge, die Yatsugatake-Tateshinayama-Kette, die Chikuma-Berge und das Vulkanische Kuppengebirge des Yakeyama.

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müssen auch die kristallinischen Schiefer von Quanto die Grenze der Auſsenzone bestimmen. Wo sich, wie es in der Ebene von Yeddo der Fall ist, die Grenze der Eruptivregion, die Spur der groſsen Meridianspalte nicht genau verfolgen läſst, da müssen eben die kristallinischen Schiefer den Ausschlag geben.

[1] Ich bediene mich hierbei derselben Namen, die schon von Harada angewandt worden sind.

3.

Südflügel des japanischen Bogens.

A. Die Auſsenzone.

Das Akaishisphenoid, das Bergland von Kii, das Bergland von Kiushiu, das Vulkangebirge des Kirishima und die Berge von Osumi und Satsuma.

B. Die Innenzone.

Die Kiso-Kette, die Hida-Kette, die Mino-Hida-Kette, die Suzuka-Kette, die Kasagi-Kette, die Katsuragi-Kette, die Berge von Sanuki und Takanawa, die stark zersägte und verzweigte Kette von Chukoku mit Einbruchkesseln am Innenrande, die durch Zertrümmerung ausgezeichnete Mulde des Setouchi Auf Kiushiu finden wir die folgenden Vulkangebirge: Azo, Onzen, Takayama, Kurodake, Yufu, Futango und Hikozan, ferner die Berge von Hizen und Chikuzen, meist vulkanische Kuppengebirge oder Kegel.

Bei vorstehender Einteilung habe ich mich soviel wie möglich den Haradaschen Benennungen angeschlossen. Es kam mir eben nicht sowohl darauf an, neue Namen zu erfinden, als Klarheit bezüglich der tektonisch-oroplastischen Gliederung der Japanischen Gebirge herbeizuführen. Was die Höhenverhältnisse und die spezielle Gliederung der einzelnen Gebirgsteile betrifft, so wolle sich der freundliche Leser an die beigegebene Karte halten, in welcher das Terrain nach 200-Meterkurven dargestellt ist.

Zum Schluſs möchte ich nur noch auf jenen eigentümlichen Gegensatz hinweisen, welcher zwischen den Bodenerhebungen der Innen- und Auſsenzone besteht. Innen finden wir Ketten und Kuppengebirge, auſsen Bergland, auf der Innenseite gibt sich eine Neigung zur Auflösung der Formen kund, während sich die Rücken im Gebiete der Auſsenzone eng zusammendrängen und die Gliederung nur in sehr unvollkommener Weise stattfinden kann.

◆

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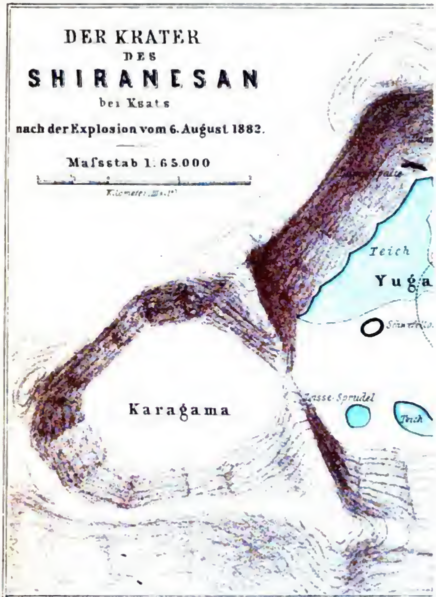

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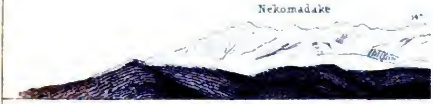

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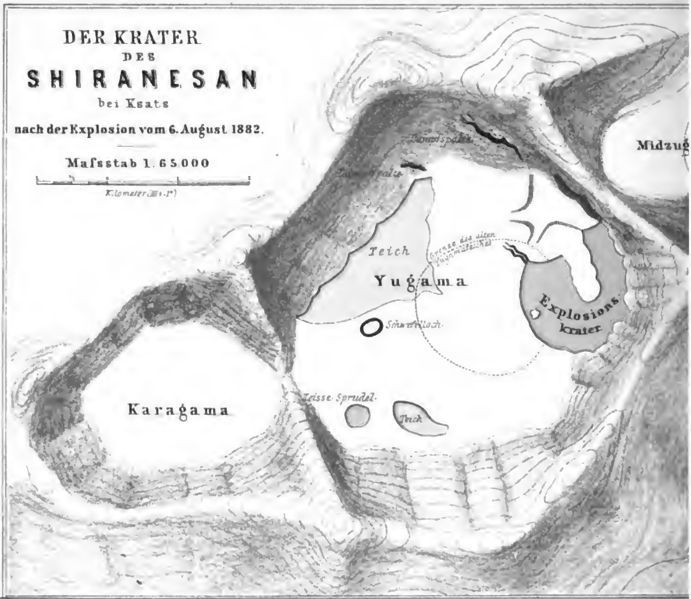

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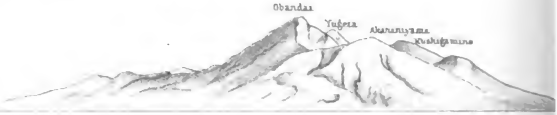

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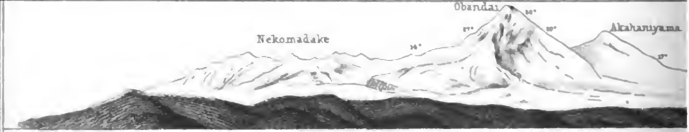

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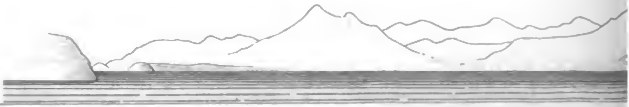

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Nebenstehender Ausschnitt einer Erdkegelschale von 120 Kilometer Dicke ist vorn durch einen Meridianschnitt, seitlich durch Flächen begrenzt, welche der Hauptgebirgsachse parallel laufen. Die Projektion ist perspektivisch extern. Der Augpunkt mit 37° Polhöhe liegt in der Ebene des 130. Meridians östl. L. v. Greenwich, 1060 Km über der Erdoberfläche. Die Bildfläche entspricht der Ebene des 134. Meridians. Wegen des zu kleinen Maſsstabs von 1:5000000 für das vordere Querprofil (alle sonstigen Teile erscheinen durch die Perspektive stark verzerrt) konnten Gebirgserhebungen und Meerestiefen nicht dargestellt werden. Eine Niveaudifferenz von 300 m würde hier nur 0,6 mm ausmachen.

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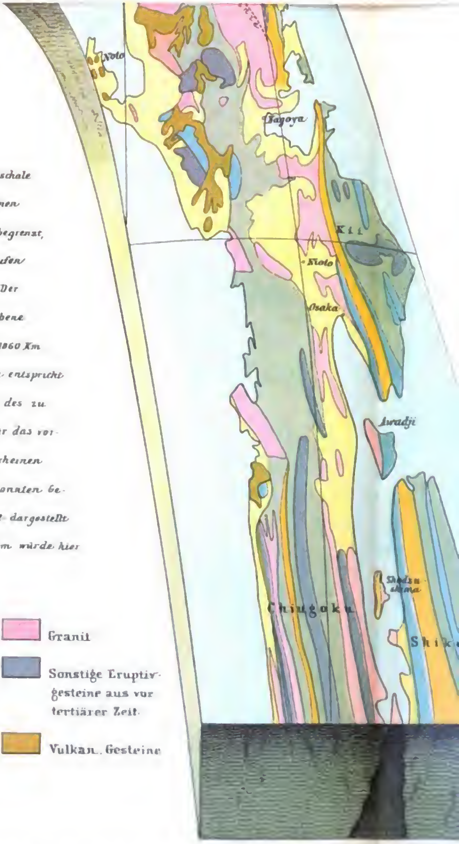

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